1859 CHEMICAL LIBRARY
FEB 27 1918
UNIV. OF MICH. LIBRARY

PUBLISHED WEEKLY 1918

AMERICAN GAS ENGINEERING JOURNAL

FORMERLY

AMERICAN GAS LIGHT JOURNAL

VOL. CVIII., No. 8
WHOLE No. 3129

NEW YORK, SATURDAY, FEBRUARY 23, 1918

Subscription $3 per year
$4 Canada $5 Foreign

"Conscripting the Economic Man"

This is the title of a timely and forceful article in a recent issue of The New York *Times* Magazine, in which the writer, Henry W. Farnam, Professor of Economics, Yale University, says:

> ***"In conscripting the economic man we must teach him discrimination until it becomes as much a habit with him to distinguish between perishable and durable goods * * * as it is for him to insure his buildings against a fire which may never come."***

Substituting "pipe" for "goods" brings this advice home to you, if your requirements call for conveying water, gas, oil, acids, etc.

The history of public utilities and private industries for the past 250 years shows

CAST IRON PIPE

to be the choice of the discriminating "economic man."

THE FIRST CAST IRON PIPE EVER MADE IN THE WORLD'S HISTORY IS STILL IN SERVICE
SERVICE
CAST IRON PIPE
MEASURED BY
CAST IRON PIPE
CENTURIES
MORE THAN 250 YEARS OLD

The Cast Iron Pipe Publicity Bureau

1 Broadway, New York

INDEX TO CONTENTS, PAGE 180

ADVERTISERS' INDEX, PAGE 20

NOTE:—

This advertisement is only to keep
you reminded of the

U. G. I. Vertical Retorts

The best system of coal carbonization
in America today

Figures prove this and the guarantees of

THE UNITED GAS IMPROVEMENT CO., Philadelphia

Back it up

The Gas Machinery Company

Cleveland, Ohio

COAL GAS PLANTS **WATER GAS PLANTS**

BY-PRODUCT MACHINERY

AMERICAN
GAS ENGINEERING JOURNAL

FORMERLY THE AMERICAN GAS LIGHT JOURNAL

Vol. CVIII, No. 8 NEW YORK, FEBRUARY 23, 1918 Whole No. 3129

The Gas Appliance Testing Laboratory—Part VI

Requirements Iron Must Meet to Be Considered Satisfactory—How They May Be Determined —What Amount of Heat Should Come From Face of Iron In Given Time

By H. M. RILEY and L. B. WILSON, JR.
Consolidated Gas, Electric Light and Power Company of Baltimore, Baltimore, Md.

Although a very simple looking device and quite easy of operation in actual practice the gas iron depends on a comparatively large number of variables working in harmony, so to speak, in order that its performance satisfactorily fulfills the customer's desires along the line of ironing.

As a general proposition, each of these variables is of almost equal importance in determining whether the iron is desirable for sales purposes. In this connection the writers can call to mind several instances where certain makes of gas irons have been sold in large numbers through the medium of sales campaigns, only to be cast aside by many of the customers after a short but nevertheless unsatisfactory period of use.

Obviously, this state of affairs was the result of the testing laboratory not being sufficiently painstaking during the time the iron was under test. This reflection upon the thoroughness of the laboratory is based upon the very doubtful assumption that gas irons have been generally tested. The results obtained by some of these appliances have been such as to clearly indicate that such attention was not deemed essential.

Before proceeding with the description proper, of methods for testing, let us enumerate and elaborate somewhat on the points in question.

Requirements That Must Be Met

The gas iron must meet the following requirements in order to be considered satisfactory:

1. It must give sufficient heat from its face at all times.

2. It must not strike back, due to reasonable changes in the composition of the gas, to slight changes in pressure, to the mechanical movement to and fro, to the burner tube becoming hot, or to the burner being turned down.

3. It must be capable of operation under a fair range of change in consumption without giving off odor.

4. It must have good heat distribution from its face.

5. It must measure up to certain physical and construction requirements.

6. It must have compactness, lines and finish.

7. The handle must not become unduly hot, nor must the back of the hand of the operator be subjected to excessive heat after a reasonable length of time when burning the proper amount of gas.

Requirement No. 1

No doubt it has often occurred to many of the readers of this article as to what constitutes the minimum amount of heat (B.t.u.) that should come from the face of a gas iron in a given time in order to operate properly from a thermal standpoint. As a basis for arriving at this figure, the writers have made a more or less exhaustive study of a 6-lb. electric iron of popular manufacture, and which, in actual practice, has proven quite up to the mark. After much experimental work, the efficiency of this electric iron was arrived at by a method which will be described in detail later, and the percentage was found to be, in round numbers, 85. From this as a starting point, the reasoning and calculations are as follows:

Rating of the electric iron: 110 volts. E.M.F. 5 amperes current. Therefore the watts equal 550.

Hence for each hour of operation the iron uses $\frac{550 \text{ watts}}{1{,}000 \text{ watts}}$ per hour = 0.55 kilowatt-hour.

Also 1 kilowatt-hour = 1,000 watts × 60 min. × 60 sec. = 3,600,000 watt-seconds, and 1 watt-second = 0.0009477 B.t.u.

Therefore 0.55 kilowatt-hour = 0.55 + 3,600,000 × 0.0009477 B.t.u. = 1,876 B.t.u.

That is to say, the total energy supplied the iron measured in thermal units is at the rate of 1,876 B.t.u. in one hour. Since the electric iron is 85 per cent efficient, the amount of heat coming from its face or ironing surface is: 1,876 × 0.85 = 1,595 B.t.u. per hour.

Now, if our gas iron is supplied with 600 B.t.u. gas, and is of an efficiency "A," there would have to be supplied:

Rating of the electric iron:

$$\frac{1,595 \times 100}{600 \times A} = \frac{1,595}{6\,A} \text{ cu. ft. per hour.}$$

If A = 50 per cent, the cubic feet per hour necessary are $\frac{1,595}{6 \times 50} = 5.32$.

If A = 60 per cent, $\frac{1,595}{6 \times 60} = 4.43$ cu. ft. per hour must be supplied, and so on.

We therefore feel safe in establishing a heat requirement of 1,595 B.t.u. per hour to be emitted from the face of a gas iron in one hour. Naturally, the consumption required will depend upon the iron's efficiency and the quality of gas supplied.

Requirement No. 2

It is a well-known fact that a primary cause for gas striking back and burning in the mixer is the change that might take place in the proportion of the combustible constituents of the gas. This is essentially so, even though the calorific value of the gas under the different conditions might remain the same. For example, we might have one gas with a high percentage of the illuminants component and low percentage of the other combustibles, and requiring, say, 4.60 cu. ft. of air to completely burn a cubic foot of the same. Then, on the other hand, we might alter this gas by sharply reducing the percentage of illuminants and increasing the other combustibles so that the gas in either case is of the same calorific value, with the difference that in the latter, say, only 4.35 cu. ft. of air are required for complete combustion. Now, if the mixer is of such a shape and design that the entrance of primary air to the extent of 60 per cent of the total needed causes flashing back, we can readily deduce that if the first gas is just safely over the striking back point the latter gas will show unusually active propensities for burning back in the mixer. Also, even though the calorific value might change with change of the gas's composition, the iron's mixer tube should still have enough flexibility of design to take care of these variations.

The matter of variation in pressure such as is generally encountered on any distribution system will, peculiar though it might seem, cause striking back in certain makes of irons.

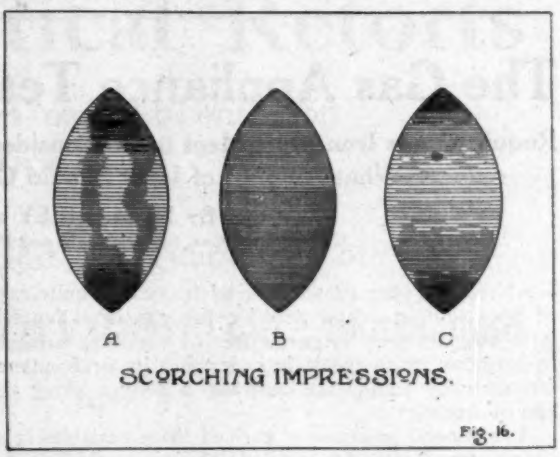
Tests will also show that some irons will burn back in the mixer after the iron has been burning for, say, a half hour, and the mixer tube has become fairly hot.

Many gas irons with otherwise first-class characteristics, will not meet the requirements when moved rapidly to and fro, as is the case in the operation of ironing, and strike back in the mixer. This takes place, as a rule, on the start of the back stroke, and is probably due to excess air entering the mixer ports by reason of the suction produced.

Requirement No. 3

Those of us who have had some experience with gas irons, and we refer particularly to experience that has been gained by contact with the householder, know that odor is probably the most insidious ailment that can affect this appliance. How often have we known the customer to return a gas iron with the remark, "I like the iron very much; it is inexpensive to operate and gives out good heat, but I get a headache every time I use it." The difficulty in a nutshell is that the iron is being supplied with more gas than it can properly burn; and let it be understood that a great degree of odor can be gotten, even though an analysis of the products of combustion show the barest trace of carbon monoxide.

To digress slightly from the point in question, the odor is due to the formation of acetylene and other kindred gases from the incomplete burning of the illuminants ($C^n H^n$) constituent of the gas, and the headache to the carbon monoxide chiefly.



SCORCHING IMPRESSIONS.

Fig. 16.

The first suggestion, and a natural one, nevertheless, to effect a remedy is to cut down the gas consumption. However, if our former statement that a gas iron (6-lb. variety) should not burn less than 4.5 cu. ft. of 600 B.t.u. gas per hour is assumed as correct, we cannot afford to reduce the consumption much below this point, otherwise the customers' speed and quality of ironing will suffer. This fact at once specifies a minimum consumption below which we cannot go to any great extent, and the degree to which we can carry the consumption in the other direction depends entirely on the intelligence with which the iron has been designed. To illustrate this latter point, let us proceed further.

Now, we know that an ideal manner in which to send appliances out onto the district is to supply each with such a size of orifice as is best suited to the pressure in a particular locality. That is to say, if we were delivering a gas iron in a territory where the pressure was 3 in., we would equip same with a No. 58 orifice (for 0.550 gravity gas). On the other hand, if the iron were to go in a 4.0 in. district, we would supply a No. 62 orifice. But we all probably recognize the fact that ideal though this scheme might seem, it makes for a much increased expense of store room work, installation and what not. Hence, at the most, we could not expect to equip our irons with more than two sizes of orifices. Let us assume that our average city pressures vary from 2.5 to 4.5 in., and also from 2 in., as an extreme minimum, to 5 in., as an extreme maximum. The scheme then would be to make provisions for sending out the irons in two sets—one to have a No. 58 orifice and the other a No. 62 orifice. In the first case a district running from 2 to 3.5-in. pressure would be supplied, and in the latter

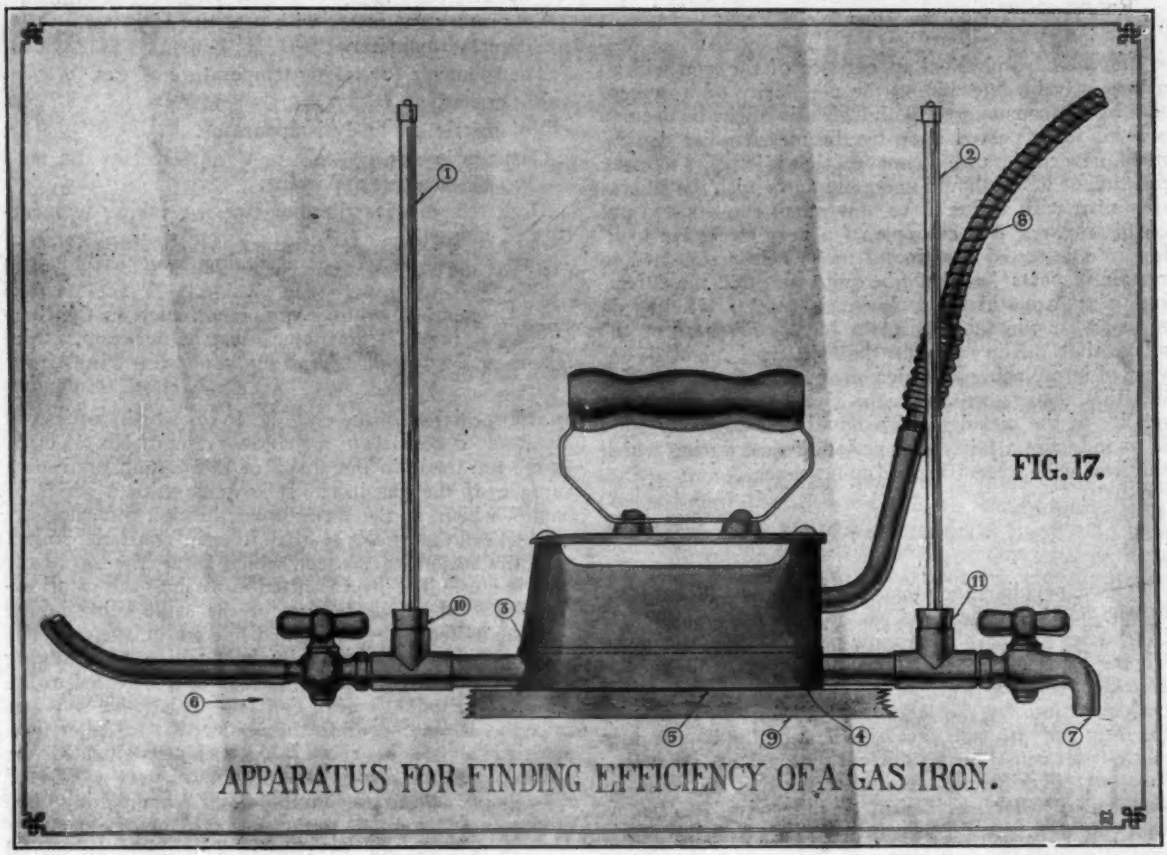


FIG. 17.

APPARATUS FOR FINDING EFFICIENCY OF A GAS IRON.

one with pressures varying from 3.5 to 5 in. We would then have a consumption varying from 3.7 to 4.9 cu. ft. per hour with the 58 orifice and from 4.1 to 4.9 cu. ft. per hour with the 62 orifice. Also, since the iron would most likely be used during the non-peak load, in either case 4.5 cu. ft. per hour would be about the consumption obtained.

It might also be mentioned that odor is oftentimes caused by steam being drawn into the iron through the ports at the bottom and tending to smother the flame.

The matter of consumption investigation also requires that we be on the watch for the likelihood of the flame making its exit through the vents at the top of the iron, thereby giving rise to the liability of scorching and burning the fabric being ironed, particularly if it is of a fluffy nature.

Requirement No. 4

The matter of the relative amounts of heat coming from the face of the gas iron is very important to ascertain. It is quite likely that an iron will give the best ironing results when the quantity of heat coming from the face in a given time increases from the back to the front, and this increase preferably should be uniform. That is, at any given point along the axis of the iron the amount of heat should be more or less the same on a line perpendicular to this axis and crossing it at the particular point. If the iron has a double point, it is probably better that each point be a little hotter than the middle of the iron's face. Of course, there is such a thing as having the point too hot and, vice versa, too cool in comparison with the rest of the ironing surface. Just how one might be able to gauge this feature is explained further. Fig. 16 shows graphically some heat distribution imprints copied from actual tests. Note case "A," which has a bad or "spotted" distribution; case "B," which is rather too uniform, and case "C," which is relatively just about correct.

Requirement No. 5

When considering this phase of "sizing up" the iron, the laboratory man must be able to detect any points of a physical nature that might give rise to complaint. He must see that the burner is rigidly held in the body of the iron, that there are no springs, catches, etc., which might get out of order, that the whole is assembled in a workmanlike manner and that any removable parts can be readily taken apart if so desired. This latter point is quite important when we consider that many of the irons will be returned for non-pay and other reasons, and must be re-nickeled, etc., for placing in stock in the storeroom. Therefore, it is essential that the repair man be able to quickly take the iron apart and not have to contend with screws that have become rusted or parts that are wedged, etc. The air mixer should be simple in design and preferably non-adjustable.

Requirement No. 6

The outward physical appearance of the iron will go a long way in determining the popularity of its reception by the consumers. Although this might be deemed a point to be passed upon by the merchandise department, nevertheless we do not feel that it is amiss to make mention of it. It should undoubtedly furnish the laboratory man with a clue as to how much emphasis to put on his report. For example, if a very attractive looking iron is tested and found to be below standard in certain respects, he should be quite sure that the defective points are stated clearly in his report. If they do not stand out in the report, the buyer, disregarding the adage that "all is not gold that glitters," might be inveigled into placing an order on appearance alone. Under this requirement it might also be stated that the quality of the nickel-plating should be sufficiently good so as to insure a fairly long period of time during which the iron will present a good appearance.

Requirement No. 7

It is a peculiar fact that the intensity of heat that can be borne on the hand of the person using the gas iron varies greatly. Also some persons make use of an ironing pad which, to a certain degree, protects the knuckles from the heat. At all events, this feature must be looked into by the laboratory during the testing of the iron, and although excessive heat on the handle does not in itself constitute a sufficient reason for condemning the iron, nevertheless it is imperative that the men devise ways, either mechanical or otherwise, to circumvent this difficulty. The point we wish to bring out is that, provided the iron passes all other requirements, it should be preferably sent out to the customer in its original condition, and subsequently, on receipt of complaint of heat on the hand, a properly designed heat shield can be installed.

Details of the Testing Routine

A. Efficiency and Thermal Characteristics

The apparatus used in the efficiency test of this appliance, and which is shown in sketch No. 17, consists of the following:

1. Fahrenheit thermometer reading to 1/10th deg.
2. Fahrenheit thermometer reading to 1/10th deg.
3. Water baffle, deflecting incoming water to the bottom or ironing surface of the iron.
4. Water baffle, causing the water to exit at the rear, near the bottom of the iron.
5. Special calorimeter soldered to the bottom of the iron.
6. Cold water supply to the calorimeter.
7. Emptying cock for hot water from calorimeter.
8. Gas supply to iron.
9. Hair felt insulation pad.
10. Rubber stopper for holding thermometer.
11. Rubber stopper for holding thermometer.

In addition to the special apparatus shown in the sketch, the following general laboratory equipment is also required.

Laboratory gas meter with pressure U gauge.
Room thermometer.
Thermometer for taking temperature of gas.
Barometer.
Volumetric gas analysis apparatus.
Gas calorimeter.
Flue gas analysis apparatus.
High temperature thermometer for taking temperature of flue gas.
Scales and vessel for weighing water from iron calorimeter.

The general laboratory equipment, such as the thermometers, meter, scales, etc., must be accurate, as determined by proper calibration, as outlined in Article III.

The special calorimeter (Fig. 18) is worthy of special mention. It consists of a shallow vessel of No. 24 U. S. gauge tin, made in the shape of the bottom or ironing surface of the gas iron. It is made with a series of baffles, which, as the water flows through the calorimeter, deflect the water so that it is in constant contact with the bottom of the iron which forms the top of the calorimeter. The iron is fitted down into the calorimeter, the level of the bottom of the same being in the position indicated by the dotted line on the sketch. The calorimeter is held firmly in the position by soldering it to the sides of the iron. Attention is directed to the temperature of 110 deg. Fahr. to which the water is raised as it may occur to the reader that a higher temperature should be run. This was attempted by the writers, with the result that the cooling effect was found to be insufficient to prevent the solder from melting. An attempt was also made to make a permanent calorimeter upon which any gas or electric iron might be placed without utilizing the bottom of the iron as a part of the calorimeter itself. (See page 398, *American Gas Light Journal*, Dec. 22, 1913.) The water chamber of this calorimeter was formed of light copper sheet metal, but it was discovered that the contact, and hence the conductivity, was too imperfect to produce accurate results. We would suggest that the outlet water be led off from the top of the tee fitting at the point marked "11," and that the thermometer for registering the temperaure of the outlet water be inserted into the end of this fitting, which is shown in the sketch as connected to the outlet cock marked "7." This modification, it is thought, will constitute a desirable change in the apparatus as shown, as the thermometer will be brought in contact with the outlet water closer to the point where it leaves the calorimeter.

Before beginning to record the test data, the iron should, of course, be lighted for a reasonable length of time, with the water passing through the calorimeter at a steady rate of flow, governed by an adjustment of the outlet cock ("7"), which will insure that the calorimeter is running full of water. This preliminary run should be continued until the outlet water has attained a maximum temperature of about 110 deg. Fahr., after which the test proper may be begun and the data recorded. The temperature of the flue gas and the flue gas sample should be taken just inside the top vents of the iron where the products of combustion are exhausted into the room. In taking the sample of the flue gas for analysis, care must be exercised to have the sampling

(*Continued on page* 176)

Cambridge Experience Demonstrates Practicability of Recovering Light Oils in Small, Inexpensive Stills

Cost of Installation Approximately $600 – Comparatively Easy to Obtain Light Oil from Coal Gas by Washing with Either Gas Oil or Water Gas Tar

It is comparatively easy to obtain light oil from coal gas by washing with either gas oil or water gas tar, declared Isaac T. Haddock, chemist for the Cambridge Gas Light Company, in a paper presented before the New England Association of Gas Engineers in Boston, Feb. 20. The naphthalene is removed and the sulphur compounds are lowered, but the washed gas will pick up naphthalene from the holders and deposit it in the mains and services, unless it is diluted with some oil vapors which either condense it in the drips or carry it to the burners.

If all the gas is washed completely, the only naphthalene to be found is that which is already in the system, but if only one gas is washed, or both only partly, then it will be necessary to keep a very careful check on the naphthalene, and not wait until the poor supplies tell us it is time to begin to pray for warm weather.

Operation Begun Three Years Ago

During the last three years we have been washing our coal gas with water gas tar to remove some of the naphthalene. The washing was performed in a 2,000,000-ft. Holmes rotary, situated between the ammonia rotary scrubber and the purifiers. The tar was pumped to our storage tank and sold.

This tar carried from 3 to 4 per cent light oil, which we found could be cheaply extracted by means of a small still and the distilled tar was more valuable for road purposes.

The still consisted of a 100 hp., four-pass Wainwright heater set horizontally. When used as a feed water heater, the water flows through the tubes and the exhaust steam circulates around them, but when used as a light oil still, this condition is reversed. The steam enters at one end through the tubes and leaves by the condenser water outlet, which is connected to a trap. The tar enters the top of the still at one end, and passing around the tubes flows out from the bottom of the still at the opposite end. The height of the tar in the still is regulated by the height of the overflow and the pressure in the still. The vapor outlet consists of a 6-in. cast-iron pipe about 10 ft. long filled with large stones, which is connected to the 6-in. opening in the center of the heater when in a horizontal position. The top of the cast-iron pipe is connected to a condenser and the condenser connected to a 1,200 gal. tank set at a slight angle in the ground so that the water can be drawn off each day.

Later a 4-in. pipe jacketed with a 6-in. pipe was cut in between this cast-iron pipe and the condenser. Water flowed through this jacket and the bottom of the 4-in. pipe was connected through a syphon to the tar inlet. This acted somewhat as a dephlegmator and reduced the tendency of the still to prime when there was a lot of water in the tar.

Washing Coal Gas with Gas Oil

Last May we began to wash our coal gas with gas oil instead of water gas tar, and this benzolized oil was distilled and returned to the rotary.

It was necessary to use our drip lines to transfer the oil, so it was pumped into the rotary intermittently. From the rotary, it overflowed to a wash box and was then pumped back to the still.

One thousand three hundred gallons of oil were pumped into the rotary twice in twenty-four hours. This made 1 gal. of wash oil per 1,000 ft. of gas. The first distillations showed about 6 per cent yield of light oil, which was due to gas oil carried over with the steam. After the oil had been circulated through the rotary two or three times, the yield dropped to 3 to 4 per cent.

The gas oil was circulated about fifteen times, and then some of the debenzolized oil was used in the water gas set. This gave 92 B.t.u. per gallon oil per M. Another part of this oil was benzolized and used in the same way. This gave 107 B.t.u. per gallon of oil per M.

Carbon that had been picked up from the coal gas made it necessary to by-pass the oil meter, and we also found a hard deposit of pitch growing on the bottom of the debenzolized oil tank. This was easily removed by using water gas tar in the system for twenty-four hours.

Test on still run twenty-four hours:

1,649 gal. benzolized oil produced	91 gal.	light oil
Steam used in coils	1.074 lb.	
Steam in oil	996 lb.	
	2,070 lb.	

Test on candle-power and B.t.u. of coal gas before and after 1,300 gal. of gas oil had been pumped into the rotary:

Time	C.P.	B.t.u.
9.15 a. m.	13.8	598*
9.45 a. m.	13.7	599*
10.15 a. m.	14.2	605*
10.45 a. m.	14.2	596*
11.15 a. m.	14.0	588†
11.45 a. m.	13.0	581
12.15 a. m.	12.3	585
1.00 a. m.	12.1	587
1.30 a. m.	12.1	585
2.00 p. m.	12.6	578
2.30 p. m.	13.1	599
3.15 p. m.	13.5	602
3.45 p. m.	13.6	592

* No oil used.

† Oil pumped in at 10 a. m.

Laboratory tests were made on the candle-power and B.t.u. of the gas after it had been washed with gas oil.

TABLE

	Unwashed B.t.u.	Washed B.t.u.	Lost B.t.u.	Per Cent Lost
Coal gas..	533	522	11	2.1
Coal gas..	544	526	18	3.3
Coal gas..	593	567	26	4.4
			18	3.3
Water gas.	511	483	28	5.5
Water gas.	525	497	28	5.3
			28	5.4
Mixed gas.	520	502	27	5.1
Mixed gas.	533	504	29	5.4
			28	5.3

	Candle-power	Candle-power	Lost Candle-power	Per Cent Lost
Coal gas...	14.4	4.0	10.4	72
Coal gas...	14.5	4.7	8.8	61
Coal gas...	14.6	6.1	8.5	58
Coal gas...	14.1	4.2	9.9	70
			9.4	65
Water gas.	10.0	4.4	5.6	56
Street gas.	13.4	3.1	10.6	77
Street gas.	13.4	3.6	9.8	73
			10.1	75

* Burner Sugg D. High Cone.

The question of naphthalene began to demand consideration, and tests were made at the inlet and outlet of the rotary. Most of these tests extended from eight to twelve hours.

	Inlet	Outlet
No. 1	26.1	2.6
No. 2	27.0	1.9
No. 3	23.7	2.4
No. 4	17.0	1.5
No. 5	38.5	1.0
No. 6	23.5	4.3
No. 7	13.5	5.6
	24.2	2.9

88 per cent taken out.

So it seemed evident that the oil washing reduced the naphthalene and the sulphur compounds in the coal gas. Unfortunately we could only wash the coal gas, and our 500 B.t.u. water gas contained as high as 30 grains of naphthalene.

This gave about the same amount of naphthalene in the mixed gas as we had at the same time during the previous year—August 12.5 grains, September 14.5 grains.

A great many services became stopped and we discontinued washing, and devoted our attention to relieving the situation. The deposits were of a hard crystaline nature at first, which we believe was due to the absence of the light vapors necessary to hold the naphthalene in suspension. The light oil that we had on hand was run through a steam jacketed heater, and most of the benzol so obtained was driven into the main at the outlet of the governor. This changed the deposit of soft flakes.

WORKING WITH KEROSENE

Then we began to put kerosene through this heater at the rate of 50 gal. per day. The first 1,000 gal. disappeared and no trace of it was seen in the drip, but the second 1,000 gal. showed in the drip about 200 yd. from the holder and the oil that collected there was pumped out and returned through the heater. Up to Jan. 15, 1918, we have used only 2,000 gal. of kerosene.

After kerosene was put in, the naphthalene dropped at the works faster than it did uptown, which led us to believe that the kerosene was taking care of the naphthalene coming from the holder and was cleaning out the system.

NAPHTHALENE

	Works	Central Square
1917, August	12.9	13.2
1917, Sept. 1-12	13.1	13.3*
1917, Sept. 13-30	9.9	13.9
1917, October	4.5	11.6
1917, November	2.4	9.7
1917, December	1.7	7.2
1918, Jan. 1-15	3.2	2.5

* Kerosene put in.

Our kerosene heater is much too small to give proper vaporization and I am of the opinion that it would pay us to install a small compressor so that we could use compressed gas and atomize the kerosene in the form of a mist in the main in the opposite direction to the flow of the gas. I believe that this cold fog would act more efficiently than a hot one, and the amount of kerosene used could be easily regulated as it is possible to obtain spray nozzles that will deliver a required amount per hour under a given pressure.

DETERMINING THE NAPHTHALENE

The method used to determine the naphthalene in the gas consisted of passing the gas through a wash-bottle containing acid sulphate solution, then a wash-bottle containing 50 cc. of saturated solution of picric acid —(there must be at least four holes in the bottom of the washing tube).

The gas is run at the rate of 5 to 10 ft. per hour, depending on the amount of precipitate that is being formed. The solution is filtered through a dry filter and 25 cc. are titrated with N/10 K O H. Lacmoid is used as an indicator. The solution is not diluted before the titration is made.

Twice the titration of the 25 cc. subtracted from the titration of the 50 cc. equals the cc. of K O H, which would be equivalent to the picric acid precipitated by the naphthalene. This result can easily be calculated in grains of naphthalene.

One cc. of N/10 K O H = 1.98 grains of naphthalene per 100 cu. ft. of gas, which 10 cu. ft. of gas have been passed through the picric acid.

In order to determine the accuracy of the method, we

dissolved C. P. naphthalene in alcohol, this solution was run into 25 cc. of picric acid solution, and the precipitate was filtered on a Gooch crucible with suction. The precipitate was dissolved in alcohol, and titrated with N/10 K O H, also the filtrate was titrated.

The results show that when a little over half of the picric acid is used up the determination is accurate within 1 per cent. The error seems to be due to the effect of the yellow color of the picric acid on the green end point of the Lacmoid. In titration a large amount of lacmoid is used and the solution is not diluted.

2.1618 grams in 250 cc. alcohol lcc., 0.008647 grams naphthalene.

25 cc. picric acid — 13.0 cc. K O H.

12 cc. Nap. sol. in 25 cc. picric acid sol.:

Filtrate, 5.3 cc.....	0.1020	0.1038 Gooch
Precipitate, 7.6 cc...	0.1007	
10 cc. Nap. sol.....		
Filtrate, 6.4 cc.....	0.08745	0.0865
Precipitate, 6.6 cc.....	0.08745	

On Nov. 12-13 a test on our mixed gas was made by the Chemical Service Laboratories, Inc., to determine the amount of paraffines in the benzol and toluol, and it showed the following results:

Meter Time	Index	Inlet Temp. Gas	C. P. Rich	C. P. Scrubbed	B.t.u. Rich	B5.t.u. Scrubbed
12.00 a. m.	5850	58	8.30	3.84	556	550
6.30 p. m	000	43				
7.00 p. m.	250	43				
8.00 p. m.	650	46				
9.00 p. m.	1000	46				
10.00 p. m.	1250	44	8.6	2.4		
11.00 p. m.	1550	44			557	532
12.00 p. m.	1950	41	7.9			
1.00 a. m.	2250	40				
2.00 a. m.	2550	41	9.2	2.3		
3.00 a. m.	2850	41			554	524
4.00 a. m.	3150	42	8.5	1.9		
5.00 a. m.	3450	43			553	534
6.00 a. m.	3800	43	9.8	1.9	556	534
7.00 a. m.	4200	43	6.97	2.16		
8.00 a. m.	4550	42			556	539
9.00 a. m.	4900	42	7.74	2.47		
10.00 a. m.	5200	48	8.3	2.50	556	537
11.00 a. m.	5550	48	8.3	3.15		
12.00 a. m.	5850	58	8.39	3.84	556	550
1.00 p. m.	6200	54	8.49	4.48		
2.00 p. m.	6500	51	8.20	4.41	555	545
3.00 p. m.	6950	50	8.40	4.46		
4.00 p. m.	7200	51	8.35	4.64	557	549
5.00 p. m.	7500	48				

Average temperature, 45.5 deg. Fahr.

Average barometer, 29.9.

Mixed gas, 74 per cent coal gas and 26 per cent water gas.

Candle-power using 8-hp. Bray burner.

Standard used—candles.

Average C. P. rich gas, 8.37.

Average C. P. scrubbed, 3.07.

Average B.t.u. rich gas, 555.5.

Average B.t.u. scrubbed, 537.5.

Average loss C. P., 5.30.

Per cent loss C. P., 63.20.

Average loss B.t.u., 18.0.

Per cent loss B.t.u., 3.24.

Amount of gas scrubbed (corrected to 60 deg. Fahr.), 7,747.5 cu. ft.

Total amount of oil recovered, 6,000 cc. (1.585 gal.).

Light oil obtained per M., 0.205 gal.

Toluene obtained per M., 0.031 gal.

ANALYSIS

Olefines	3.3 per cent
Benzene	58.4 per cent
Toluene	15.0 per cent
Solvent naphtha.....	8.9 per cent
	85.6 per cent

Specific gravity of original oil...	0.8732
Specific gravity of benzene.....	0.8829
Specific gravity of toluene.....	0.8668
Paraffine in toluene.....	2.28 per cent
Paraffine in benzine.....	1.27 per cent

The total amount of light oil was low, as the gas was not thoroughly scrubbed during the last six hours. We were, however, very much surprised at the high amount of paraffines found in the toluene.

We tried washing the water gas with straw oil in the laboratory, and tested the gravity of the benzine and toluene. This gave us as high as 7 per cent paraffines, so we used cottonseed oil instead. This gave us a benzine from the water gas having a gravity 0.8815

Toluene gravity..... 0.8688

Benzole from coal gas gravity..... 0.8852

Toluene from coal gas gravity..... 0.8681

which showed that the benzine and toluene from each gas was satisfactory as to gravity, and that the high paraffine content must have come from the kerosene we were spraying into our main at the outlet of the governor at the time this test was being conducted.

After we had control of the naphthalene we began to wash our gas again. This time we used water gas tar, circulating the tar in the same way as the oil, except that the debenzolized tar was run into the water gas tar separators, and then pumped mixed with the fresh tar to the rotary. This kept the debenzolized tar thin and workable, and when it had accumulated beyond the capacity of the system, the debenzolized tar was pumped to our storage tank to be sold, giving us a tar free from water and better for road purposes.

Sample of light oil from water gas tar washing:

800 cc. distilled in a 1-liter flask—

40.5 per cent to 100 c.

65.9 per cent to 120 c.

75.0 per cent to 135 c.

85.0 D. per cent to 160 c.

95.8 per cent to 200 c.

C. P. benzine boiling within 2 deg. sp. gr., 0.8838.

C. P. toluol boiling within 2 deg. sp. gr., 0.8707.

The cost of installation was approximately $600. This cost covered heater, piping and labor. The tanks and pump lines, which we had been using for water gas tar separation, were used for this washing. Labor, steam and gas oil to make up loss in B.t.u. was figured at approximately 7.5 cents per gallon of light oil produced. This does not include the cost of pumping.

In discussing this paper, C. J. Ramsburg, of the H. Koppers Company, suggested that a small jet spray be used in injecting the kerosene instead of a compressor. He thought the amount of steam used too large.

Gas Appliance Testing Laboratory—Part VI.

(*Continued from page* 172)

tube well in the gases in order to insure against the taking of any of the air of the room which would otherwise be considered as excess air in the thermal calculations. This, obviously, must be carefully guarded against. Simultaneous readings of the thermometers and the gas meter should be taken at uniform and frequent intervals during the progress of the test, and radiation and conduction losses should be provided against by the use of the insulating pad and the avoidance of drafts.

HEAT CALCULATIONS—EFFICIENCY TEST OF A GAS IRON

The laboratory test having been completed, the essential facts or data gathered by the laboratory man will appear as follows:

DATA

Test No. 3. *Date of Test,* 8/4/16.

Place of test—The Gas Fuel Company, Johnsville, N. J.

Appliance tested—The "X" gas iron.

Apparatus used—Gas iron, special calorimeter, thermometers, scales, etc.

Object of test—To determine the efficiency of the "X" gas iron and the heat losses in the flue gas and by radiation from other than the ironing surface of the iron.

Recorded Observations During Test

Time (Min.)	Meter Reading (Cu. Ft.)	Temperature Water Deg. Fahr. Inlet	Outlet	Weight of Water (Lb.)
0.0	0.00	87	110.2	0
2.0		87	109.6	
4.0		87	109.4	
6.0		87	109.6	
8.0	0.60	87	110.4	
10.0		87	110.8	
12.0		87	110.3	
14.0		87	110.1	
16.0	1.20	87	110.4	
18.0		87	109.8	
20.0		87	109.6	
22.0		87	109.7	
24.0	1.80	87	110.3	
26.0		87	110.0	
28.0		87	110.5	
30.0		87	110.3	
32.0	2.40	87	109.8	37
Average	2.40	87	110.0	37

Temperature of gas, 88 deg. Fahr.
Temperature of test room, 89 deg. Fahr.
Barometer, 29.85.
B.t.u.'s per cubic foot gas, 604.
Gas pressure (ins. water), 3.0.
Temperature of flue gas, 589 deg. Fahr.

Average Flue Analysis

Carbon dioxide (CO^2)	10.3 per cent
Oxygen (free) (O^2)	5.3 per cent
Carbon monoxide (CO)	0.6 per cent
Nitrogen (N^2)	83.8 per cent
	100.0 per cent

Volumetric Gas Analysis

Carbon dioxide (CO^2)	2.8 per cent
Illuminants (C^2H^4)	6.1 per cent
Oxygen (O^2)	0.4 per cent
Carbon monoxide (CO)	16.4 per cent
Methane (CH^4)	26.7 per cent
Hydrogen (H^2)	45.5 per cent
Nitrogen (N^2)	2.1 per cent
	100.0 per cent

Test Calculations

Correction of gas consumption to standard conditions of 60 deg. Fahr. and 30.00 in. barometer:

Barometer reading, 29.85 (inches of mercury).

Add 0.22, which is the pressure in inches of mercury equivalent to 3.0 of water (see Table 2, Article III).

Deduct 0.17 (inches of mercury) to reduce the barometer reading from that observed at the room temperature of 89 deg. Fahr. to the standard condition (see Table 3, Article III).

Corrected pressure, 29.90.

The correction factor by which the observed gas consumption must be multiplied to ascertain the corrected gas consumption may be found by reference to Table No. 1, Article III, for gas at a temperature of 88 deg. Fahr. and a barometric pressure of 29.90. The correction factor is found by interpolation to be 0.92.

Corrected gas consumption is, therefore,

$$0.92 \times 2.40 \text{ cu. ft.} = 2.21 \text{ cu. ft.}$$

Hence 1 cu. ft. of gas completely burned without any excess air would produce the following flue gas:

Carbon monoxide (CO^2)... 0.581 cu. ft.

COMBUSTION TABLE—1 CU. FT. OF GAS (TABLE NO. 4, ARTICLE III)

Constituent	Amount (Cu. Ft.)	Air Required	CO^2 Formed	H^2O Formed	N^2 Given Off
Carbon dioxide (CO^2)	0.028	....	0.028	....	....
Illuminants (C^2H^4)	0.061	0.880	0.122	0.122	0.697
Oxygen (O^2)	0.004	—0.019	....	....	—0.015
Carbon monoxide (CO)	0.164	0.394	0.164	....	0.312
Methane (CH^4)	0.267	2.568	0.267	0.534	2.034
Hydrogen (H^2)	0.455	1.092	....	0.455	0.865
Nitrogen (N^2)	0.021	....	....	....	0.021
Total	1.000	4.915	0.581	1.111	3.914

Water vapor (H^2O)..... 1.111 cu. ft.
Nitrogen (N^2)..... 3.914 cu. ft.

And 2.21 cu. ft. of gas thus completely burned will produce the following flue gas:

CO^2 ..... 1.284 cu. ft.
H^2O ..... 2.455 cu. ft.
N^2 ..... 8.650 cu. ft.

Determination of the amount of flue gas and excess air:

Assuming "a" cu. ft. of flue gas. Then the carbon in the flue gas, which is, of course, represented in the CO^2 and CO constituents, may be ascertained by the following calculation (see Table 5, Article III):

Carbon in CO^2 of flue gas =
$a \times 0.103 \times 1.857 \times 3/11 = 0.052164$ a oz.
Carbon in CO of flue gas =
$a \times 0.006 \times 1.195 \times 3/7 = 0.003074$ a oz.

Total weight of carbon in flue gas = 0.055238 a oz.

a = cubic feet of flue gas (unknown).
0.103 = decimal equivalent of 10.3 per cent, the proportion of CO^2 in the flue gas.
1.857 = weight in ounces of 1 cu. ft. of CO^2 gas under standard conditons.
3/11 = ratio of the atomic weight of carbon in CO^2 to the molecular weight of the CO^2 gas.
0.006 = decimal equivalent of 0.6 per cent, the proportion of CO in the flue gas.
1.195 = weight in ounces of 1 cu. ft. of CO gas under standard conditions.
3/7 = ratio of the atomic weight of carbon in CO to the molecular weight of CO gas.

Carbon in 1 cu. ft. of fuel gas is as follows:

$CO^2 = 0.028 \times 1.857 \times 3/11 = 0.013272$ oz.
$C^2H^4 = 0.061 \times 1.195 \times 6/7 = 0.062481$ oz.
$CH^4 = 0.267 \times 0.678 \times 3/4 = 0.135769$ oz.
$CO = 0.164 \times 1.195 \times 3/7 = 0.083983$ oz.

Total C in 1 cu. ft. = 0.300505 oz.

Carbon in 2.21 cu. ft. of fuel gas = 2.21×0.300505 oz. = 0.664116 oz.

Now, as there is no carbon lost in combustion, then the quantity of carbon by weight in the flue gas equals the weight of the carbon in the fuel gas burned.

Therefore, 0.055238 "a" oz. = 0.664116 oz., and

$$\text{"a"} = \frac{0.664116}{0.055238} = 12.02 \text{ cu. ft. of dry flue gas.}$$

Hence the volume of the constituents of flue gas are as follows:

Carbon dioxide (CO^2) =
0.103×12.02 cu. ft. = 1.238 cu. ft.
Oxygen (O^2) =
0.053×12.02 cu. ft. = 0.637 cu. ft.
Carbon monoxide (CO) =
0.006×12.02 cu. ft. = 0.072 cu. ft.
Nitrogen (N^2) =
0.838×12.02 cu. ft. = 10.073 cu. ft.
Water vapor (H^2O) =
1.111×2.21 cu. ft. = 2.455 cu. ft.

Now as all oxygen in the flue gas represents an excess over and above that required for complete combustion, and as the oxygen supplied by the air introduced, oxygen being 20.8 per cent of air by volume, then the excess air supplied $= \frac{0.637 \text{ cu. ft.}}{0.208 \times 2.21} = 1.39$ cu. ft. per cubic foot of gas burned.

Efficiency Calculations

Sensible heat in gas: B.t.u.'s

H^2, N^2, O^2, $CO = 0.644$
$[0.0189 + 0.0000009\ (88 - 60)]\ (88 - 60) = 0.341$
$CO^2 = 0.028$
$[0.023 + 0.000008\ (88 - 60)]\ (88 - 60) = 0.017$
$CH^4 = 0.267$
$[0.0237 + 0.000008\ (88 - 60)]\ (88 - 60) = 0.177$
$C^2H^4 = 0.061$
$[0.0287 + 0.000008\ (88 - 60)]\ (88 - 60) = 0.049$

For 1 cu. ft. of gas..... = 0.584
For 2.21 cu. ft. of gas..... = 1.291

Sensible heat in air for combustion and excess air:

Cubic feet air required for complete combustion of 1 cu. ft. of gas..... = 4.915
Cubic feet excess air supplied for cubic feet of gas burned..... = 1.39

Total air supplied per cubic feet of gas consumed ..... = 6.31

Sensible heat supplied in air = 6.31 [0.0189 + 0.0000009 (89 — 60)] (89 — 60) = 3.46 B.t.u.'s per cubic foot of gas consumed, or for 2.21 cu. ft. of gas equals 7.65 B.t.u.

Heat of combustion = 2.21 + 604 B.t.u. = 1,334.84 B.t.u.'s.

Total heat supplied = 1.29 + 7.65 + 1,334.84 = 1,343.78 B.t.u.'s.

Heat in 37 lb. of water at 110 deg. Fahr. = 2,883.8 B.t.u.
Heat in 37 lb. of water at 87 deg. Fahr. = 2,035.4 B.t.u.

B.t.u.'s added to water = 848.4 B.t.u.

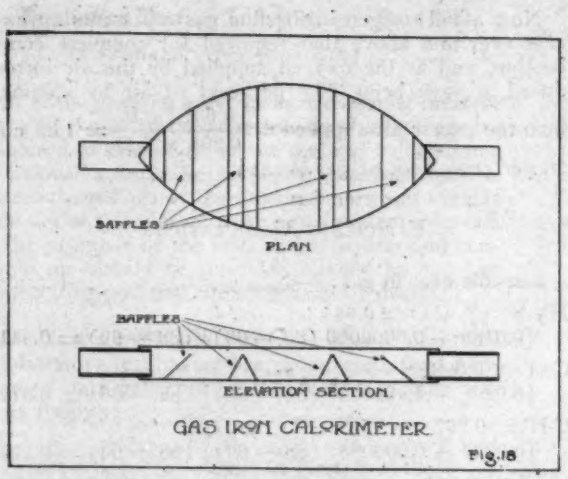
$$\text{Efficiency} = \frac{848.4 \times 100}{1{,}343.78} = 63.1 \text{ per cent.}$$

Flue and radiation losses:

Sensible Heat in Flue Gases

O^2, $N^2 = 10.71$ B.t.u.
$[0.0189 + 0.0000017\ (589 - 60)]\ (589 - 60) = 105.8$
$CO^2 = 1.24$
$[0.023 + 0.000008\ (589 - 60)]\ (589 - 60) = 15.9$
$CO = 0.07$
$[0.0189 + 0.0000009\ (589 - 60)]\ (589 - 60) = 0.7$
$H^2O = 2.45$
$[0.021 + 0.000005\ (589 - 212)]\ (589 - 212) = 18.8$

Total = 141.2



For specific heat of constituents per cubic foot, see Table 8, Article III.

Latent Heat of Vaporization of Water of Combustion

Weight of 1 cu. ft. of water vapor at 60 deg. Fahr. and 30.00 in. barometer = 0.0478 lb.

Latent heat vaporization of 2.45 cu. ft. water vapor = $2.45 \times 0.0478 \times 965.1$ B.t.u. = 115.8 B.t.u.

Sensible heat in water of combustion = $2.45 \times 0.0478 \times 151.92 = 18.2$ B.t.u.

Heat of Combustion Loss Due to Incomplete Combustion of CO Gas

Heat of combustion of 1 cu. ft. of CO = 342 B.t.u. Therefore the presence of 0.07 cu. ft. of CO in the flue gas represents a heat loss of 0.07×342 B.t.u. = 23.9 B.t.u.

Total heat lost in flue gases:

$$141.2 + 115.8 + 15.2 + 23.9 = 299.1$$

Percentage of heat lost in flue gases $= \frac{299.1 \times 100}{1,343.78}$

= 22.3 per cent.

Percentage of heat lost by radiation = 100 per cent — (63.1 (used usefully) + 22.3 per cent (lost in flue)) = 100 per cent — 85.4 per cent = 14.6 per cent.

The results obtained may be clearly shown by the following heat balance tabulation:

Heat Balance

	Heat Supplied B.t.u.	Heat Disbursed B.t.u. Usefully	Wastefully
Heat of combustion of gas	1,334.84		
Sensible heat in gas	1.29		
Sensible heat in air supplied	7.65		
Sensible in flue gas			141.2
Latent heat of vaporization of water combustion			115.8
Sensible heat in water of combustion			18.2
Heat of combustion in CO of flue gas			23.9
Heat from ironing surface of iron		848.4	
Heat radiated from other portions of iron, etc.			196.3
Total	1,343.8	848.4	495.4

B. Heat Distribution

The heat distribution on the face of a gas iron is determined as follows: A sheet of white typewriting paper of the usual size and thickness is laid evenly on a thin layer of insulating material, such as powdered asbestos or Sil-O-Cel, contained in a shallow pan, and by means of an iron (cold) it is ironed out or pressed until there is smooth and intimate contact of the insulating material with the paper. The iron is then lighted and allowed to burn for ten minutes with the consumption of about 4.4 cu. ft. per hour. At the expiration of the ten minutes, the iron is placed on the sheet of typewriting paper and firmly held down by the hand for a period of fifteen seconds, after which it is withdrawn. The result will be that a scorching impression is left on the paper which quite distinctly gives the distribution of heat. Naturally, the two time periods of ten minutes and fifteen seconds are purely arbitrary, and may be varied to suit conditions. That is to say, if the paper is burned through, the heated iron need only be applied for ten or twelve seconds, or the ten minutes' heating-up period can be shortened. Incidentally, this sheet can be embodied in the report and forms a permanent and visible record which will be found vastly more satisfactory than a lengthy written description. Fig. 16 shows some scorching impressions.

C. Heat on Handle

As stated above, the handle of most any make of iron will become quite hot after a period of burning, therefore, this phase of the testing will be chiefly concerned with devising a shield to properly dissipate the heat. A thermometer, with blackened bulb is affixed to the handle of the iron with bulb just under the middle of the handle. The iron is then lighted and temperature readings taken at regular intervals for at least a half hour, or until the temperature rise becomes constant. Next a shield is interposed between the handle and the iron proper, and similar readings are taken. As a matter of fact, no difficulty will be experienced in devising a shield to cut the temperature to about 140 deg. Fahr., or even less. For graphic illustration and description of this test, the reader is referred to page 585, American Gas Engineering Journal, June 16, 1917.

D. Striking Back

Srtiking back, due to the movement of the iron to and fro, is tested for by moving the iron in a lighted condition through the air and suddenly reversing the direction of movement. Or the iron may be placed

between two electric fans about 4 ft. apart and both running on high speed, and the same effect gotten by alternately interposing a sheet of cardboard between each fan and the iron.

Striking back on account of too hot a mixing tube is detected by allowing the iron to burn at the proper consumption for about an hour and noting any peculiarities along this line.

The "change in the composition of the gas" phase of the question can be investigated in one or two ways:

1. Long method, whereby the iron is placed out on the district for a period of several months and any developments noted.

2. Short method, in which the iron is tested in the laboratory by means of various kinds of gases. This, of course, presupposes that the laboratory has some cylinders of different gases, thereby enabling one to vary the ordinary city gas to the point or mixture desired.

The test for striking back tendencies, due to drop in pressure, is carried on by adjusting the iron for the proper consumption at laboratory pressure, and then suddenly dropping the pressure to 50 per cent of its original reading. This is best accomplished by feeding the iron from a small holder, and at the desired moment suddenly taking one of the weights from off the holder bell.

E. Odor-Giving Properties

The liability of an iron to give off odor, due to an increase in the consumption of gas, is determined by adjusting it for the proper consumption of about 4.5 cu. ft. per hour (600 B.t.u. gas), and then increasing the same to about 5.5 cu. ft. per hour, and searching for any incomplete combustion by the sense of smell. Incidentally, the iron should be able to safely accommodate a 20 or 25 per cent increase in consumption without giving off odor.

The "steam-odor" test consists in moving the iron rather slowly over an overly wet cloth so that the forming steam is allowed to enter the bottom vent holes and circulate through the iron. This will tend to have a smothering tendency on the flame, and if this effect is too pronounced a disagreeable odor will be the result.

Peculiarly, some irons do not operate satisfactorily where much steam attends the ironing, and others whose design is very nearly the same are not affected. The writers are of the opinion, however, that an iron which draws in its circulating air through a port or opening well up in the front of the iron and running through the back seems to overcome this steam-odor difficulty more readily than one which gets its circulating air through a series of lateral ports near the bottom. This is no doubt due to the fact that in the first case the openings through which the circulating air is drawn are always somewhat in advance or ahead of the forming steam, whereas, in the latter, some of the ports are slightly in the rear of the steam as it is formed.

F. Physical Features

This phase of the testing work consists chiefly in gauging the iron's worth through the medium of the eye, together with some elementary common sense. Here, too, as in the case of the gas range, it might not be amiss to have one of the practical men pass upon some of the physical attributes of the iron. Specifically, we should be on the lookout for any screws, bolts, etc., that might become baked and corroded to such a point that their ease of removal would be nullified. Also, if the top of the iron is supposed to open for lighting, the springs, catches, etc., are to be investigated. The quality of the nickel,plating, general dimensions, weight, and, in fact, any items out of the ordinary should be noted and given due consideration when rendering a decision on the iron.

How the Gas Companies Are Helping the Nation

The New York Gas and Electric Light Divisions are already in the first line trenches opposing the forces of thriftlessness and wastefulness. The officers met for discussion of plans for their campaign at a luncheon at the Engineers' Club Feb. 9. The speeches were received with great enthusiasm and it was obvious to all present that the lighting trades would be carried far beyond their quota in the war savings campaign. Among those of the gas industry present included: Frank W. Smith, chairman; F. R. Barnitz, assistant secretary of the Consolidated Gas Company; I. M. Beatty, assistant general manager, Northern Westchester and Peekskill companies; J. I. Blanchfield, general auditor, Kings County Lighting Company; Miss M. E. Dillon, office manager, Brooklyn Borough Gas Company; C. J. Ferdon, office manager, Bronx Gas & Electric Company; M. M. Graham, secretary and treasurer, New Amsterdam Gas Company; W. F. O'Brien, assistant treasurer, Standard Gas Light Company; P. J. Schneider, treasurer, Central Union Gas Company; Henry Schreiner, superintendent of branches, Brooklyn Union Gas Company; J. L. Thomas, commercial superintendent, New York & Queens Gas Company; E. H. Webster, auditor, Queensboro Gas & Electric Company; E. S. Young, assistant secretary, New York Mutual Gas Light Company; Lewis B. Gawtry, vice-president, Consolidated Gas Company; C. G. M. Thomas, treasurer, Consolidated Gas Company; H. E. McGowan, secretary, Brooklyn Union Gas Company; R. E. Livingston, Consolidated Gas Company.

Charles G. Dawes, president of Dawes Bros., Inc., the holding concern for several gas companies, is doing good work at General Pershing's headquarters in France, according to first-hand information brought to Chicago recently by Sir Walter Lawrence, a veteran soldier of the Western Front and Mesopotamia, who is in America on a mission for the British Army. Mr. Dawes went to France as a lieutenant-colonel with the 17th Regiment of Engineers, which is understood to have had a part in building a transcontinental railroad into Italy. Later, Mr. Dawes was raised to the rank of colonel and was transferred to General Pershing's headquarters, with the title of purchasing agent for the United States Army Expeditionary Force. Sir Walter met Colonel Dawes on a visit to the American Army headquarters in France. He reports the former gas man as shouldering a big task and doing it well.

AMERICAN GAS ENGINEERING JOURNAL

FIFTY-NINTH YEAR

Published Weekly by
AMERICAN GAS LIGHT JOURNAL, INC.
42 Pine Street, New York, N. Y.

ELBERT P. CALLENDER, *President*
STANTON G. KRAKE, *Vice-President*
FREDERICK A. SOUTHWORTH, *Secy-Treas.*

EUGENE C. MILES, *Editor*

Subscription $3.00 per year, including postage in the United States, Mexico, Cuba, Porto Rico, Hawaii or the Philippines.
In Canada, $4.00 Foreign, $5.00
Single Copies, 10 Cents.

WESTERN MANAGER
E. B. FRITZ

CHICAGO OFFICE
537 So. Dearborn St.

Entered at the Post Office, New York City, as Second Class Matter.

CONTENTS

THE GAS APPLIANCE TESTING LABORATORY, PART VI. By H. M. RILEY AND L. B. WILSON, JR. 169

CAMBRIDGE EXPERIENCE DEMONSTRATES PRACTICABILITY OF RECOVERING LIGHT OIL IN SMALL, INEXPENSIVE STILLS..... 173

HOW THE GAS COMPANIES ARE HELPING THE NATION 179

EDITORIALS 180

MERCHANDISING GAS..... 183

SIMPLY BECAUSE A BUSINESS IS OVERSOLD IS NO REASON TO LET PUBLIC FORGET THAT IT EXISTS. By J. E. BULLARD..... 183

NEWS OF THE GAS INDUSTRY..... 187

SOCIETIES AND ASSOCIATIONS..... 189

PERSONAL NOTES..... 192

CONSTRUCTION NOTES—PAGE 15 OF ADVERTISING SECTION

One Year Behind, and More

Almost a year ago this JOURNAL pointed out the need of increased merchandising efforts in order that the utmost yield of toluol might be obtained from the gas companies. Time went on and it looked as if toluol recovery would be restricted to relatively few companies. Our suggestions as to increased merchandising efforts were ignored by all but a few. Many followed the opposite course, curtailing them entirely.

Now come the tidings that the need of toluol is so enormous that even the humblest contributions from the smallest companies will be very welcome, and toluol recovery with home-made and inexpensive plants is practical and even profitable to small companies.

The recovery of toluol is, of course, proportionate to the output of gas. And no company is manufacturing gas to pump it to the blue skies. Unless there are users for it who will pay the allotted rates to obtain it, the gas will not be made.

It would be interesting, were it possible, to estimate just how much greater would be the gas industry's capacity for producing toluol had all the gas companies heeded the JOURNAL's suggestion to speed up merchandising, than it now is. How much, too, have we hampered ourselves by curtailing our merchandising organizations, as many have, should we decide immediately to attempt to make up for lost time? How much could have been gained had we had faith in the obvious, had we refused to be held back by outward appearances solely, knowing full well that the cold logic after all will prevail in any situation?

Some feared they might not get coal. Sober judgment should have told them that sooner or later the authorities would awaken to the importance of the gas industry to the nation and of a maximum gas production, even if only to the extent of its relation to toluol production.

Others feared to lay out the capital necessary to stock up. Such a fear is inexcusable. Sound merchandising pays for itself. The biggest department store in England, run by an American, by the way, has done a bigger business since the war started than ever before.

But why harp on what is past. It is human to err, and the man who has made mistakes and acquired knowledge from them is an infinitely better man than he who has invariably estimated right.

The future is ahead; and 10,000,000 gal. of toluol are required beyond present maximum production. It will take a considerable output of gas to bridge the gap. Much of it is already being made without the toluol being recovered. Utilizing this will fill in part of the deficiency. Making still more will

bridge it further. No company is free from the responsibility of making an effort to recover its maximum possible quota of the toluol deficiency. Consequently, no company is true to itself that fails to build its load up to the highest point it can carry.

A Peep Into the Future

There are pessimists in every calling, but in the gas industry pessimism must be a most unsatisfactory indulgence, if the pessimist is grounded on the history of the industry and is mentally capable of looking ahead.

There is a certain type of critics that seemingly derives great delight from pointing out how the gas industry has made it a practice to follow the line of least resistance in its development. This is true. It has.

But an ordinary degree of common sense will reveal that the adoption of such a course has invariably been the height of business acumen, and is undoubtedly responsible in large part for the present healthy state of the gas industry as a whole to-day.

First it was lighting.

The field was developed to the point where further development was not so easy, and electric lighting came to divide the market.

There are those who assert the gas industry should have devoted its whole efforts to fighting electric competition tooth and nail.

But would that have been good business? The cooking field was offering itself as a source of comparatively easy "new business."

This journal does not believe the gas industry was craven in devoting a great part of its efforts to this new field, even at the penalty of losing a part of its lighting load that might possibly have been saved.

Had the industry confined itself to lighting it is possible that electric lighting might be a smaller factor in our national life than it is to-day, but then, too, the gas industry would have been a vastly smaller industry than it now is.

For the immediate present the house heating and industrial fields loom up as the most likely sources of new business comparatively easy to obtain.

A year ago we would have selected the industrial field as the first to be developed. But recent events have taught the people of the country a great lesson, have revealed to them many things that had never occurred to them before. As a consequence, selling gas for house heating no longer presents the selling difficulties it once did. Gas men do not to-day await the advent of cheap gas to inaugurate their house-heating efforts.

What do the developments of these two fields alone represent to the gas industry? Take the heating end:

If every family in New York City alone had in use one portable gas heater it would mean at a very conservative estimate the consumption of 30,000,000 cu. ft. of gas per day. On their days of record load during the present winter the Consolidated Gas Company, of New York, and the Brooklyn Union Gas Company had a combined output of 230,000,000 cu. ft. Assuming that they have plant capacity at present to maintain such a pace day after day, which is not probable, this 30,000,000 cu. ft. consumed by the heaters would involve in itself a capacity increase of over 13 per cent. Try to visualize the size of the company's plants now, and figure the expenditure such an increase would involve and the number of new employees that would have to be taken on.

These figures are, of course, hypothetical and advance merely to illustrate our argument. A good many families in New York City now have gas heaters, and in really estimating the increase involved by each family's possessing one heater the existing consumption would have to be deducted. But then, too, the figures given of present capacities are gauged on what the companies were able to do on one particular day working at an intensely forced draft. Also, if heating by gas was so general as the possession of one portable heater by each family would indicate, it is highly likely that the average number of gas-heating units per family would be considerably more than one.

Now let us look at what a fuller development of the industrial field means.

Sometime ago we published an article in which it was declared that, working at full blast, the industrial furnaces manufactured by one British factory in two years would consume 1,600,000 cu. ft. of gas per hour. It wouldn't seem fanciful to assume that the two gas companies cited, working in their highly developed territory, could dispose of in one year all this manufacturer could produce in two. Taking an eight-hour working day, we would have in this year's work alone an addition of practically 13,000,000 cu. ft. per day additional output, necessitating an increase in capacity and working organization of more than 5 per cent.

As a matter of fact, developing the industrial and heating fields to the extent that they could be developed with relative ease under present conditions and rates quite probably would necessitate an American gas industry of double its present size and almost doubled in number of workers engaged.

Then there is another development that may occur within the next generation possibly. That is, taking electric lighting in apartment houses, office buildings and other places where a relatively large number of lights are needed off the electric central station, and putting it onto gas engines working in each cellar.

There is small ground for pessimism as regards the

future of the American gas industry, or the future of the man who links his destiny to it. It can develop as rapidly as it has the will to, and the history of the past demonstrates it will make haste slowly, thus insuring that it will build on a permanent basis.

The Psychology of the Deposit

Somewhere in the United States there is a gas company which, to the consumer's viewpoint at least, is very reluctant to take a deposit previous to the opening of an account. One patron, new to the territory, even got the impression that its employees' greatest anxiety in opening a new account was to find some loophole whereby they could waive the deposit and still keep within the technicalities. The matter of the five dollars was not important, but this patron went out of the company's office well pleased. There is a considerable sap to a man's pride in such an attitude on the part of a big public utility.

Later this same man, through carelessness, got a little behind in his payments; so much so that the company was faced with the necessity of possibly shutting off his gas. How did the gas company meet this situation? By a note, in which it conveyed the impression that to it, and the writer personally, this necessity was about the most disagreeable and abhorrent with which it could be faced.

The delinquent consumer explained the impression this letter made on him somewhat sheepishly. He was an intelligent man, and knew that the tone of the note was in conformity with a standardized plan of developing good will, and the same note was undoubtedly daily being sent to hundreds of others, but his vanity—and we all possess it—kept prodding him into the thought that it was a personal tribute to him from the gas company.

"Actually," he declared, "I believe I hurried up on that bill more on account of the company's feeling than because of the consequences to myself."

This man is a real friend of the gas company.

There was a hint of increased rates recently.

"Of course they should get it" he exclaimed. "How they can furnish gas at the rates they're getting is a mystery to me. Why, I've never paid a bill of more than a dollar and a half a month in my life. Last week my wife thought she smelled gas through all the day. I didn't when I came home, but I thought it best to be sure.

"The company sent up three men and they nosed around my place for a couple of hours without finding anything. Then, did they bawl me out for calling them in on a wild-goose chase? They did not.

"The foreman said: 'There's no leak as far as we can find. But you did right in calling us in. It's best to play safe. Mebbe, too, your wife is right. If she smells anything to-morrow, give us a call.'

"When you count what those men's time cost, and what it costs to read my meter and collect the bills, it certainly looks to me as if the company is going to supply my gas for the next year for nothing."

The public relationship work that can get consumers to consider such items is certainly effective, however we may view it.

This consumer, of course, did not know that in normal times big consumers were making up the deficit his account and similar accounts were leaving on the company's balance sheets. In such times he and his kind, as a matter of common justice, should pay more per thousand cubic feet of gas used and the big consumers less.

He did not know, either, that the gas company had probably determined on its policy of eliminating deposits as far as possible from a business viewpoint rather than a psychological standpoint, figuring that the saving in interest it would have to pay would more than offset the losses through unpaid accounts.

And he did not stop to consider that it is just as easy to write a courteous note in regard to a backward gas bill as it is to write a pre-emptory demand, and the cost of mailing is the same for either.

All he knew was that by its dealings with him the company had established an intimate friendly contact in his mind. And that is the secret of this particular company's success in its public relations.

There are few gas companies which are not doing a great deal for the people they serve. Bring these things to their attention. Make even your bills, if humanly possible, bring a ray of friendly warmth into their homes. Make them feel that they know you and you know them.

Nine-tenths of the hatreds in the world to-day are founded on lack of understanding. It is difficult to hate a man, unless he wants you to hate him, when you are talking face to face with him. That is why men, when a subject that is fraught with possibilities of misunderstanding must be discussed, prefer to do it by a face-to-face talk rather than by letter.

Develop that sense of intimacy between you and your people. It will not cost you any more and it may save you thousands of dollars.

Postponing Prosperity Is Good Business Nowadays

The war savings stamp plan is a means of directing the nickels, dimes and quarters of the ordinary man into the United States Treasury for safekeeping, so that at the end of the war the poor man may find himself no less poor, if not richer, than he was at the beginning. It means "postponed" prosperity, and thus from the business point of view is a most desirable asset.

Pertinent Suggestions for Increasing Efficiency of Commercial Department

Manufacturer's Representative, Nationally Known, Confidentially Expresses His Views—What Is Wrong with Some Commercial Departments

He is the field manager of a large appliance manufacturer. He has supervision of all territories and comes in personal contact with gas companies in every section of the country. He is nationally known to gas men. His experience has afforded him a unique opportunity to observe their good qualities and shortcomings, and he was speaking in strict confidence. This is what he said:

Perils of Following Course of Least Resistance

After a careful study for the past ten years of the merchandising methods of gas companies throughout the United States, I am convinced that many are not getting the good results they should from their commercial departments. Why? Simply because they are following the course of least resistance and are not giving the careful attention to this department that they are to the manufacturing and distributing departments.

The result is the commercial department is made the dumping ground of the organization, and is a very unsatisfactory branch. There are, of course, many exceptions, and there could be many more if gas companies, instead of trying to buy the cheapest appliances there were on the market, and several varieties of these, and getting the cheapest salesmen they could find to sell these appliances, would adopt a high-grade line, one complete enough to satisfy the demands from all classes of consumers (and there are several such lines on the market), standardize this line and stick to it even though it

(*Continued on page* 186)

Simply Because a Business is Oversold Is No Reason to Let Public Forget That It Exists

Merchandising Efforts Necessary On the Part of Gas Companies in Wartime for Simple Purposes of Keeping Consumers Aware That It Does Handle Appliances If for No Other Reason—Otherwise New Business Later Will Be Very Difficult to Obtain

By J. E. BULLARD

No farmer has ever been able to raise the maximum possible crop from a given plot of ground without using fertilizer on that ground. No more has any business establishment ever been able to secure the maximum possible sales from any given territory without using salesmen and advertising in that territory. Where farms are close together and comparatively small, and some of the farmers use fertilizer so intelligently that they have extremely large crops, it is easy for the other farmers to see that it will pay them to use fertilizer in the same way. In a similar manner in the business world, where there are a number of companies competing in the same field, and some of them are making great profits as a result of their sales and advertising methods, it is apparent to the others that it would pay them to go after new business with a greater degree of intensity. However, if a farm is located out on the plains, and there is a great distance between farms, it may not be so apparent to this farmer that it will pay him to use more and better fertilizer. He has not as good a standard for comparison as has the farmer who is farming in a section where farms are close together and intensively cultivated. In the same way the business which has practically a monopoly in its territory, such, for instance, as that enjoyed by gas companies, it is not so apparent that it will pay to use intensive methods to increase sales as it is in the automobile business, where these methods must be used for a concern to survive.

Expert agriculturists will tell you that there is no land which it will not prove a profitable investment to intelligently fertilize. Expert merchandising men will also tell you that there is no business that can afford to neglect the selling and the advertising end. For a time all may seem to go well, but in the case of the land the productive power continues to decrease, until it finally bankrupts the farmer unless he begins the fertilizing in time. In the same way with a business, all may seem to be going well. Dividends may be paid regularly, and everything appear satisfactory. In fact, everything may be satisfactory except that the company has little or no good will. The result, unless attention is given in time to good-will building, will be that when a time of stress comes this business will be driven upon the rocks.

Water companies have never been noted for their advertising and business-getting methods. Most water

Completely Gas Heated Apartments

ERECTED BY ELLANAR REALTY CO., AN ENTIRE BLOCK FRONT FROM 63D TO 64TH STS., ON EAST SIDE OF 4TH AVE., BROOKLYN, N. Y., COMPRISING EIGHTY-EIGHT THREE, FOUR AND FIVE ROOM APARTMENTS. HEATED WITH CLOW GASTEAM RADIATORS. INSTALLED BY EASTERN GAS APPLIANCE CO.

GROUP OF HOUSES BUILT BY THE REMINGTON ARMS PLANT, BRIDGEPORT, CONN., FOR USE OF EMPLOYEES, EACH ONE HEATED BY CLOW GASTEAM RADIATORS. INSTALLATION MADE BY THE BRIDGEPORT GAS LIGHT COMPANY.

companies are now municipally owned. The telephone and the telegraph systems have for many years been spending enormous sums in advertising and selling. They have endeavored to build up a good will that will stand them in real stead in case of emergency. The telephone and the telegraph systems are to-day working hand in hand with the Government, but there is no present indications that the Government will undertake the operation of these systems. It would seem that it most certainly pays to maintain a well organized and efficient sales and advertising department.

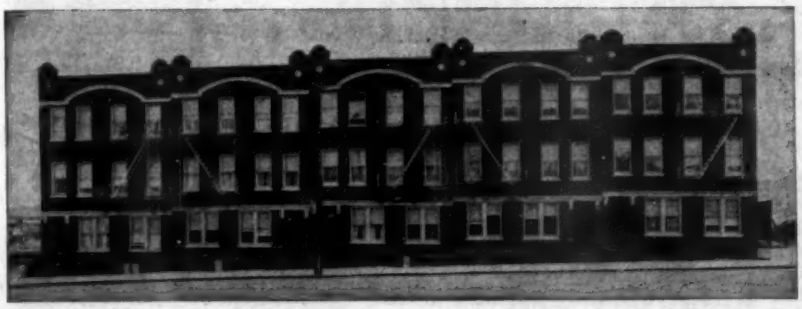
Advertising When Oversold

To-day there is considerable discussion among business men as to the advisability of advertising when the business is already oversold. In other words, whether an attempt should be made to maintain the good will of the company now that this good will cannot be used to increase profits. Farmers have much the same problem on their hands. The cost of fertilizer is very high. It is also hard to get, and in many cases it is doubtful whether the use of fertilizer will increase the farmers' profits. It probably will increase crops, but it may not increase profits. Even the non-advertising business man, however, is likely to advise the farmer to use fertilizer in order that the productivity of the land may not be reduced and the crops at the close of the war be so small that famine will threaten the land.

Fertilizer on the farm, however, is not radically different from advertising and selling in business. Business men may make good profits for the duration of the war, but if they discontinue all effort to build good will sales will not be so easy after the war and these businesses are exposed to the competition of the world. Therefore, just as the farmer should use fertilizer to guard against the possibility of a famine after the war all business men should continue to advertise and to build good will in order that when the war is over sales for American-made goods will still be forthcoming and that the country will not be overwhelmed with foreign-made goods.

There are a great many business men who see this clearly. There are some, however, who apparently prefer to take chances. The public utility business is no exception to other businesses. From the outbreak of the war many gas and electric companies have been decreasing their expenditures for sales and advertising work. An electrical man who had a fairly complete list of new business men and jobs available showed me the files in which he kept them. The file of men available was overflowing. That of new business positions available was nearly empty. This record represented high-class men trained for central station work or for combination gas and electric work. Most of those men have already left the public utility business for good. Some are in the Government service.

No Longer a Theory But an Actuality



ERECTED BY SUB-EL DEVELOPMENT CO. AT 341-353 64TH STREET, BROOKLYN, N. Y. BUILDINGS CONSIST OF FIVE SIX-FAMILY HOUSES. HEATED BY CLOW GASTEAM RADIATORS. INSTALLED BY EASTERN GAS APPLIANCE COMPANY.

BUILDING ERECTED BY ENGEL CONSTRUCTION COMPANY, AT 425 SIXTY-FIRST STREET, BROOKLYN, N. Y. (BAY RIDGE). BUILDING CONTAINS TWENTY-FOUR APARTMENTS, CONSISTING OF SEVEN FIVE-ROOM AND SEVENTEEN FOUR-ROOM APARTMENTS, HEATED EXCLUSIVELY WITH CLOW GASTEAM RADIATORS. INSTALLATION MADE BY EASTERN GAS APPLIANCE COMPANY.

Others are in other and more lucrative industries. Up to the end of the war their absence may not be felt, but when the war does end it will be extremely hard to replace them.

Estimating the Cost

There is also another question to consider. What has it cost the industry to lose the good will of many of these men who have been very unceremoniously pushed out of the industry because gas and electric companies felt they could make as much profit for the duration of the war without making any attempt to build or to retain good will as they could by making an attempt to do so?

Minimizing the Importance of the New Business Department

Farmers are coming more and more to realize that the problem of fertilizing the soil needs to be under the supervision of an expert if the best and the most profitable results are to be obtained. No longer is this work left to half wits or to untrained men. In those lines of business, however, which appear to be monopolistic—there is no such thing as a real monopoly in business—the new business and the advertising departments are rarely considered to be as important as they really are.

Some Mistakes to Be Avoided

To-day far too little attention is given to the effect that selling and advertising methods may have upon the public. Take one instance to illustrate this point: A certain gas company was experiencing a good deal of trouble with its mains on account of the unprecedented cold weather. At the time the gas bills were being made out the gas failed completely. In spite of this fact, however, the bills were mailed, and were received by the consumers while the gas was still shut off, and they bore on their backs this message: "Keeping warm without coal. Let our representative call and explain how it is done. We carry a full line of room heaters, gas logs and gas radiators."

What effect do you think such a message would have upon the consuming public at a time when there was no gas supply? An expert merchandising man would never allow anything like this to happen. In case he could not print new bills in time he would have at least had cards printed which explained that due to the unprecedented cold weather a pipe line had frozen, that the freezing of this line, which carried gas under very high pressure, could not have been foreseen. That there was now working on the problem one of the best gas engineers in the country, who had made the statement that never in the history of the gas business had he heard of a gas line freezing under such conditions. That soon the gas supply would become normal again.

What did happen was that all sorts of rumors were rife in regard to the

company. Some said it was out of coal. Others said that it was out of oil. Others said that the plant had completely broken down and it would be months before the gas was turned on. The little innocent looking advertisement on the back of the bill confirmed in the minds of the consumers the worst rumors, and at one stroke, and an unnecessary stroke at that, thousands of dollars' worth of good will was destroyed.

Advertising Against the Use of Your Product

There are men who advocate the advertising of a curtailment of the use of gas. This does not mean reducing the waste, but using other fuels than gas. If these men were going to shoot a pistol they would not be likely to grasp it by the muzzle, for they would see the danger of doing so. They are doing much the same thing, though, when at this time they talk about advertising to consumers that they use substitutes for gas. In England the advertising to reduce buying of luxuries has not had the desired results; so men who can be expected to know what they are talking about tell us. Should the gas industry advertise advising people to use substitutes for gas, it is more than likely that the public would not heed it. In fact, it is quite possible that such advertising would at the same time increase the consumption of gas and decrease the good will of the industry.

Advertising that would be effective and a way in which the sales and the advertising departments of every gas company could now be used to build up good will and to increase sales after the war, and it is not so difficult to secure an adequate supply of all kinds of gas appliances as it is at present, would be as follows:

Use as much or more advertising space as has been used in the past, but use it to show the public how to get the best results from gas appliances. It is probable that fully a third of the gas now being used for domestic purposes is wasted. If this third was saved there would be just that much more left for industrial uses and to conserve the coal supply.

The automobile industry has used methods similar to this to very good effect. At the outbreak of the war there was agitation towards the reduction of the manufacture and the use of automobiles. Statistics gathered by one of the large manufacturers' associations indicated that if the waste in gasoline could be eliminated there would be an ample supply for all the needs of the army and navy with no reduction in the use of automobiles.

The result of this campaign has been an overstock of gasoline with no undue reduction in the use of motor cars on account of the war. In fact, transportation experts are now urging the greater use of gasoline-driven vehicles to relieve the railroads of some of their traffic..

Keeping the Salesmen at Work

If gas company salesmen instead of being discharged were used to teach people how to stop the waste of gas, if they were sent from house to house to inspect all gas appliances and make sure they were in the best operating conditions, if the advertising department also helped in educating the public it should not be difficult to considerably relieve the present overload on the plants while at the same time building up an after-the-war demand that will prove more than welcome. Such work could also be made to straighten out the load curve of the distribution system.

Confiscation of 15 Tank Cars of Oil and Several of Coal Relieves Gas Shortage At Detroit

Confiscation of 15 cars of gas oil and several cars of coal consigned to industrial plants by the local fuel administration the early part of February and diversion of them to the Detroit (Mich.) City Gas Company has solved the gas situation for the time being at least. The oil and coal are sufficient to meet the company's immediate needs. Fuel Administrator Edgar B. Whitcomb and his assistants, who made the seizures, took only cars consigned to companies less in need of coal and oil than the gas company, which for several days has been threatening a shutdown unless immediate relief was forthcoming.

Through arrangements made with the Standard and the Sun Oil companies, in Detroit and Toledo, tank cars consigned to factories in Detroit were seized and diverted into the gas company's yards, where they were unloaded and turned into the company's storage tanks.

Pertinent Suggestions for Increasing Efficiency of Commercial Department

(*Continued from page* 183)

costs a few cents more than the Cheap John appliances, this difference in cost will not affect the volume of business at all.

Inadequacies of Salesmen

Gas company salesmen are usually taken from commercial schools or other lines of business, and know little or nothing about the general construction of gas appliances or the proper adjustment of burners, or the correct usage of the different prices and terms.

The commercial manager naturally has too many other matters to look after to give much attention to training his salesmen, and the result is that when a sale is made the consumer knows practically nothing about what he is buying, or the right way to use it, and if he does not get perfect results both the appliance and the gas company are blamed, whereas it is simply a case of poor salesmanship.

A Tip to the Manager

Mr. Gas Manager, if your commercial department has been running at a loss and you are threatening to throw it out, before you do so put yourself for one year in the hands of the representative of some high-grade appliance manufacturer, and let him guide you.

Take on one line and carry enough of an assortment of this line to meet the standard demands.

Put enough margin on your appliances to make your commercial department a profit maker.

Let the factory representative of the line you decide to handle come into the business with you and train your men how to sell his goods.

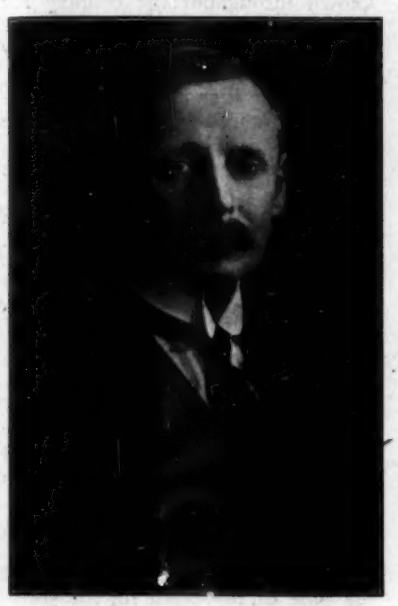
Let him work with them, and he will be glad to do so. He can keep up their enthusiasm and selling energy better than you can, because he comes in direct contact with successful selling methods from all parts of the country, and you do not.

He has just one thing to develop; you have many, consequently his concentration upon the one question makes him more forceful than you can be.

(*Continued on page* 192)

NEWS OF THE GAS INDUSTRY

Retiring President of New England Association of Gas Engineers



DR. J. F. WING

Temporary Rate Increase Granted Indiana Company

The Indiana Public Service Commission has just entered an order, as a war emergency measure, authorizing the Indiana Fuel & Light Company, which operates plants at Kendallville, Garrett and Auburn, Ind., to increase its schedules of gas rates during a period not to exceed two years. There were no protests from any of the cities represented in the petition, but the commission did not grant the full prayer of the company's petition, which asked for a permanent increase in gas rates.

A net increase of 25 cents a thousand cubic feet was granted, bringing the new price to $1.50 gross and $1.40 net, while it had been $1.25 gross and $1.15 before. The commission's order pointed out that the new rates may be changed at any time.

Need of Effort on Part of Every Gas Company, However Small, to Recover Toluol Brought Out at Annual Convention of New England Association of Gas Engineers

Possible to Effect Results in Small Works With Home Made and Inexpensive Plant—Full Compensation for Product Assured—Market Will Continue After War—Need of Saving All Drip Oil—Its Value

No gas company, however small, is doing its duty to the nation unless it makes an effort to recover all the toluol that its manufacturing process will permit. There is need of 10,000,000 gal. more of the derivative than are now in sight. Even minute contributions are wanted to help fill in the gap.

The recovery is possible in home-made plants, inexpensively constructed. Full compensation is assured to any company that makes the effort. There will be a market for toluol, benzol, etc., after the war.

These facts were brought out at the annual meeting of the New England Association of Gas Engineers held in Boston, Feb. 20 and 21.

The meeting was opened at close to the set time by President Wing. A. M. Barnes, of Cambridge, presided during the delivery of the president's address, which preceded its scheduled order on the program by two numbers. Messrs. Morrison, Cooper and Nichols were appointed as a committee on president's address. The report of the board of directors followed.

John R. Freeman, the new president of the Providence Gas Company, a prominent hydraulic engineer; F. C. Butler, of Greenfield, Mass.; Carleton Warren, George H. Fullerton and David Barrett were the new members elected. H. H. Smith and William Gould were elected associate members. The association lost three members by death and at the reading of the report had 284 members.

The Coal Situation

In his paper on the coal situation in New England, which was read by Mr. Chase, of the New England Fuel & Transportation Company, Edward Page emphasized the close interconnection between the coal industry and the railroads. Due to their location mainly in valleys, the mines from which the New England gas companies' coal comes from cannot provide extensive storage. Consequently, they work, on the whole, only when cars are there to take away their product. This has tended to desertions of miners seeking steadier work, and diminished product due to the fact that cars frequently have been lacking. The arbitrary prices, too, regardless of quality, have tendered to lower the latter and put companies which do not have thick seams, etc., behind in their ledger balances.

Canada, due to the lack of restrictions as to prices, got much of the coal that should have gone to New England.

With the transportation difficulties settled there would be ample coal. It all depends upon the railroads and the waterways. Any

prediction as to betterments would be little better than guesswork.

The committee on the president's address commended him for calling attention to the work of the National Council of Gas and Electric Service, and urged the companies to co-operate with it in the way of financial support.

I. T. Haddock then read his paper on benzol recovery. This paper was discussed by Mr. Warren, of Worcester, who gave an account of the experiences of his company; L. J. Willien, who spoke in a similar vein, and C. J. Ramsburg, of the H. Koppers Company.

Need of Toluol

Mr. Ramsburg brought out that the paper demonstrated the practicability of toluol recovery in small gas works with home-made plant, inexpensively constructed from scrap materials and equipment.

He urged all gas companies, however small, to do their bit in toluol recovery; none should hold back in making the effort.

There is a lack of 10,000,000 gal. of toluol for the national needs, counting in all production that can be with reason expected. No production is too small to be serviceable.

The small company can be assured of full compensation for all the toluol it recovers. Mr. Ramsburg referred the small company manager to Lieutenant-Colonel Burns, of the Ordnance Department in Washington, for advice as to the disposal of his toluol product. The market, too, will exist beyond the war. The toluol, benzol, etc., will have a use as motor fuel.

A high percentage of naphtha in toluol, it is known, destroys its availability for explosives, but it has no deterrent effect upon its value as a motor fuel.

He urged gas companies to carefully conserve all drip oil. It will pay to save it and drum it, etc. It has a value of at least 20 cents per gallon.

Solvent paraffin likewise should not be thrown away, as toluol can be recovered from it to the extent of from 33 to 35 per cent in addition to 12 per cent of benzol.

Official Information on Coal

Mr. Snead, of the National Fuel Administrator's office, gave comfort to many gas men in the afternoon session when he stated that in his opinion nothing is more important than uninterrupted service of public utilities. He will recommend that shippers give them and domestic coal users preference over all others.

The prices for coal this year will be definitely known probably by April 1. They will probably be less on contract coal than they were last year.

On contracts now existent he believed that operators should change prices to meet the newer schedules except in so far as long haul is involved.

A. M. Barnes wanted to know if the Fuel Administrator realizes the importance of permitting gas companies to accumulate large storages during the summer.

Mr. Snead conceded the reason in this, but stated the extent to which they would be able to do this would be dependent upon the transportation system.

A resolution was adopted stating it was the consensus of opinion of the convention that the Fuel Administrator had not fully realized the importance of the gas industry, particularly in regard to the conservation that was represented, in that so large a proportion of the coal consumed was returned to use as a fuel in the shape of coke.

John J. Kirkpatrick, of the Holyoke company, called to the attention of the convention the manner in which action on the part of the Fuel Administrator had saved his plant from a possible shutdown.

Following this discussion the nominating committee rendered its returns. The following officers were elected for the ensuing year: President, J. Arnold Norcross; vice-presidents, A. M. Barnes and W. F. Norton. Directors: Burton Smart, V. E. Bird, C. E. Paige, J. K. Quinn and R. E. Wyant. N. E. Gifford was re-elected secretary and treasurer.

Society of Gas Lighting Honors Deceased Members

At a recent meeting of the Society of Gas Lighting, held at 29 West Thirty-ninth Street, New York City, the two reports of the In Memorium Committee given herewith were read and acted upon.

The undersigned, a committee having been appointed to prepare a memorial upon the demise of our member, Thomas E. Byrne, beg leave to present the following:

Whereas, It is with deep sorrow and regret that we learn of the death, on Dec. 14, 1917, of our fellow member, Thomas Eugene Byrne, and

Whereas, Mr. Byrne has for upwards of fifty-five years been an influential figure in the gas industry, being a gas engineer who was widely known throughout the country for his knowledge of every detail of the gas business. Receiving his education at the Parochial School of St. Paul's Church and St. Francis' College, he entered the employ of the Citizens Gas Light Company as a boy, finally becoming chief engineer of the company. This position he held until the company merged in 1895 with the Brooklyn Union Gas Company. He remained with this latter company until 1900, resigning to devote his entire energies and attention to the affairs of the Kings County Gas & Illuminating Company, which was organized in 1890. With this company he occupied the position of chief engineer and general manager from its organization, and retained the same position with the Kings County Lighting Company, which absorbed the former company in 1904. In 1913 he was elected vice-president, and retained all three positions until the time of his death, in his sixty-sixth year. He was a member of the Society of Gas Lighting, American Gas Light Association, a charter member of the American Gas Institute, and a member of many other societies and organizations. Mr. Byrne was an influential member of the Democratic Party in Kings County, but many times refused to accept public office; and

Whereas, In the death of Mr. Byrne the Society of Gas Lighting has lost a comrade of marked ability, his fellow-members a friend whose sincerity and genial personality endeared him to all; therefore, be it

Resolved, That the members of this society unite in expressing their sincere regret at the death of Thomas E. Byrne, and their heartfelt sympathy to Mrs. Thomas E. Byrne and the members of the family in their great bereavement; and be it further

Resolved, That a copy of this resolution be spread in full upon the min-

utes of the society and a copy thereof be sent to Mrs. Byrne.

JAMES H. JOURDAN, Chairman,
ALEX. H. STRECKER,
E. G. Love.

FEB. 13, 1918.

To the Society of Gas Lighting.

Gentlemen: Your committee appointed at the last meeting to prepare a memorial resolution, submits the following for your consideration:

Elliott L. Spencer, who became a member of this society in 1915, died on Jan. 8, 1918, in the forty-second year of his age.

Mr. Spencer was born in Brooklyn in 1875. He graduated from Cornell University in 1896 with the degree of Mechanical Engineer. He entered the employ of the Consolidated Gas Company, of New York, soon after graduation, and remained with that company until 1902, when he was made assistant engineer at the works of the Central Union Gas Company, of New York. He was connected with the latter company up to the time of his death, and had risen to the position of engineer in charge of the manufacturing plant.

Mr. Spencer was married in 1905 to Miss Anna Dare, of Brooklyn, who survives him.

Be It Resolved, That inasmuch as death has removed from the society Elliott L. Spencer, one of its most genial and interested members, the society hereby expresses its sense of loss, and the secretary is instructed to convey to the widow an expression of the society's sorrow and its sympathy for her.

Respectfully submitted,
G. E. WOODS,
C. S. FOX,
A. H. HALL, Chairman.

Societies and Associations

THE ALLENTOWN-BETHLEHEM GAS COMPANY recently turned its office at Allentown, Pa., over to the employees of the company from Allentown, Bethlehem and Catasauqua for a social event, which was attended by more than 200 employees of the company, their wives and friends. It was a regular meeting of the employees, but added to the occasion Attorney Lawrence H. Rupp, on behalf of the company, presented a service flag to the association. There were eight stars on the flag. Attorney Rupp also made a stirring patriotic address during the evening. Selections were rendered by Weiss' Orchestra, as well as solos. A Hooverized luncheon was served Herbert Conrad, president of the employees' association, was in charge of the program.

THE PENNSYLVANIA GAS ASSOCIATION has decided to hold a one day executive session at the Hotel Adelphia, Philadelphia, Pa., on Wednesday, April 10, 1918. Further notices of the meeting will be published in later issues of the JOURNAL.

THE FALL RIVER (MASS.) GAS WORKS COMPANY EMPLOYEES' ASSOCIATION was tendered a supper recently by the street department of the company, in charge of George L. Gilbert, superintendent of that department, at which about 150 members were present. The following members of the street department had charge of the kitchen end of the entertaining: I. M. Westgate, Edward S. Stebbins, Arthur and Peter Morin. William S. Bodwell acted as head waiter for the occasion, and was ably assisted by representatives of the office sales and works department. After the supper a short business meeting of the association was held. President Hamilton presiding. Yearly reports of the secretary and treasurer were read and accepted. Next followed the entertainment, which consisted of a moving picture, "The Conqueror," featuring William Farnum, which was kindly loaned to the association for the occasion. The members went home after 10 o'clock very much pleased with the evening's entertainment, most of them with the opinion that the other departments will have to go some to get ahead of the street department when their turns come.

THE OLD COLONY GAS COMPANY held its regular monthly employees' association meeting Friday evening, Jan. 18, in the conference room. The meeting was opened by the chairman, H. B. Hall, chief clerk of the company. W. T. Pease, manager of the Rund Water Heater Company, was speaker of the evening. His topic was "Character Analysis." Mr. Pease has spoken several times to the employees of the Old Colony Gas Company, and each time has proven very interesting. After Mr. Pease's talk a very interesting entertainment was given by the employees, which included a piano duet, readings of "Some Yarn," "The Mother of a Soldier" and "A Message to Garcia," as well as violin and vocal solos. After the entertainment refreshments were served and dancing was enjoyed to the close of a pleasant evening.

THE EMPLOYEES' ASSOCIATION OF THE PITTSFIELD (MASS.) COAL GAS COMPANY held its fifth annual meeting in the meeting rooms of the organization in the gas office building. The meeting was preceded by a supper served by the refreshment committee of the society. At the business session that followed the new officers for the coming year were elected as follows: President, Berkeley Teeple; vice-president, Chauncey E. Sleighter; secretary, John J. Quinn; treasurer, Edward Roel; librarian, Rudolf Kilian; executive committee, Harry C. Crafts, David M. Cullen, Jr., William C. Gleiner. The annual reports of the secretary and treasurer were presented. Following a discussion it was unanimously voted to eliminate the suppers at the future meetings due to the present pressing demands of the war. The next meeting therefore will take the form of a smoker. It will start at 8 o'clock instead of 7 as at present. The feature of the evening was a lecture on the "Conquest of the Air," by Manager H. C. Crafts, of the gas company. The speaker traced the development of air craft and attempts to invade the air from the very earliest day down to the present. It was shown how marvelous has been the progress since the first attempt by the Wright brothers in the heavier-than-air machine. The many different types of war machines now used and the distinct uses to which each are placed was fully dwelt upon. A large and very interesting collection of slides were shown toward the conclusion of the lecture. These helped to emphasize how exclusively the development for all practical purposes has been confined to the present century.

THE AMERICAN LIGHT & TRACTION COMPANY earning statement for the year ending with December, 1917, shows that gas sales increased 11.50 per cent, electric sales 17.94 per cent and street car traffic increased 33.52 per cent, with a total increase of $2,307,138 in gross earnings.

Natural Gas Rate Increased at Fall River, Kan.

The public utilities commission recently approved an application for an increase in gas rates. The increase affects the city of Fall River, Greenwood County, Kan., in the oil and gas belt.

Gas is supplied to the town by the Wilson County Gas Company. The existing rate is 25 cents a thousand cubic feet. Under the order of the commission the rate is increased to 35 cents a thousand cubic feet.

Rate Increase Sought at Altoona, Pa.

If a new rate tariff providing for an increase of 20 cents for 1,000 cu. ft. is granted the Altoona (Pa.) Gas Light & Fuel Company by the State Public Service Commission, only one consumer, the Pennsylvania Railroad Company, will be affected.

Increased cost of coal and oils necessary for the manufacture of gas is responsible for the officials' request. The rate will actually be raised from 70 to 90 cents, the present schedule permitting a discount of 10 cents for prompt payments. Thus, under the revised scale, the consumer using 75,000 cu. ft. or more each month will be charged $1, but the discount will make it 90 cents. The rate at present is 80 cents, less the rebate, or 70 cents.

Smaller consumers or those utilizing less than 75,000 cu. ft. each month will pay $1.10. The railroad company is assessed on a graduating scale, which is lowered after a certain amount is used. It is the largest consumer in the city and has been paying on a basis that was less than the cost of production. The gas is used throughout the shops, in nearly all departments.

San Francisco Company Given Permission to Issue Stock

The railroad commission recently authorized the Western States Gas & Electric Company, San Francisco, Cal., to issue $178,000 7 per cent preferred stock at not less than par, but with 10 per cent for commissions, after it had been shown that $816,097 had been expended in betterments in the last eleven months.

Corning, N. Y., Company Will Suspend Increased Rates Till Public Service Commission Holds Hearing

In order to give the city of Corning, N. Y., opportunity to have threshed out before the public service commission at Albany the question as to whether or not the Crystal City Gas Company is violating the provisions of its franchise by increasing the cost of gas to consumers from 40 to 50 cents per thousand feet Jan. 1, it was announced that the company had agreed to suspend the operation of its rates until March 1. In the meantime the city will present the facts to the public service commission and ask for a ruling on the point.

The company's franchise places 50 cents as the maximum rate at which gas may be sold in the city. The proposed increase advances the price of gas to 55 cents per thousand feet for all gas not paid for by the 10th of the month following the month of consumption.

Advance In Rates For York, Pa.

January statements of the York (Pa.) Gas Company announces an increase of 5 per cent a thousand cubic feet.

This increase is in addition to the increase of the service charge from 10 to 25 cents, a note on which appeared in the Dec. 22, 1917, issue of the AMERICAN GAS ENGINEERING JOURNAL. The new charge is $1.20 for the first 1,000 ft. used and 10 cents less for succeeding thousands.

Rate Increase Petition Filed By Bronx Gas and Electric Company

The Bronx Gas & Electric Company, serving the territory represented by the old town of Westchester, in the Bronx, has petitioned the public service commission for permission to charge $1.50 per 1,000 cu. ft. Its present rate is $1 a thousand cubic feet.

The commission has taken the petition under consideration, and at its meeting on Feb. 13 was to set a date for a hearing, at which the company will be called upon to set forth in detail its reasons for desiring the increase. The company says it does not receive an amount equal to the cost of production, and that each thousand cubic feet of gas manufactured and delivered costs $1.145, "without any return whatever upon the capital investment."

580 B.t.u. Set As Definite Standard for Providence

Establishment and maintenance of a recognized standard of gas for Providence, R. I., of 580 B.t.u. per cubic foot of gas, is the basis of the agreement reached by the representatives of the city and the Providence Gas Company, and which the city council will be asked to pass upon favorably.

Under this agreement the gas company will be required to maintain this standard until it begins the extraction of toluol from its product, at which time a different average will be made by agreement between the company and the city, or will be fixed by the State public utilities commission.

Adoption of the agreement by the city council will end the controversy between the city and the company which has been waged between the City Hall and the State House since early last fall.

Under the new agreement, the net price for gas will be as follows: Up to 5,000 cu. ft., $1 per thousand; 5,000 to 10,000 cu. ft., 95 cents per thousand; 10,000 to 50,000 cu. ft., 90 cents per thousand; 50,000 to 125,000 cu. ft., 85 cents per thousand; 125,000 to 250,000 cu. ft., 80 cents per thousand; excess, 75 cents per thousand.

Coal Shortage At Its Worst In Willimantic, Conn.—Gas Heaters Suggested

The coal situation in Willimantic, Conn., is the worst that it has been. At present there is no hard coal to be had, and the prospect is not bright for any. One dealer stated that the only car he had any hopes of had been located in the East Hartford yard. The other dealers state that they have coal ordered, but have no idea when it will reach Willimantic.

The chairman of the local fuel committee has stated that it is certain there will not be enough coal for minimum needs here for the next four weeks, and he makes the suggestion that in all cases possible gas heaters be used.

Recruits Wanted For Gas and Flame Regiment

Most men of the red-blooded, adventure-seeking type rebel at the thought of remaining in the United States from six months to a year before getting into active service and hearing the shells cracking around them. There are few branches of the service that offer service earlier than three months. Of these few the Thirtieth Engineers is one. It is the regiment termed the "Gas and Flame," and is charged with the use of dangerous gases and chemicals in offensive action. This unit is a purely combatant organization and uses not only trained professional men, but men having some technical ability, such as skilled and experienced electricians, pipe fitters for both large and small size pipe, powder men experienced in the handling of black and smokeless powder, and carpenters capable of doing light frame work. Draftsmen, both mechanical and topographical, surveyors, sheet-metal workers experienced in cutting, assembling, riveting, etc., and auto mechanics are also needed for the remaining companies.

Two companies are already "over there," preparing for their part in the great struggle. Two more companies are now getting things shaped for early movement at Fort Myer, Va. In addition to these the last two companies, E and F, are being recruited as rapidly as possible, to join the Thirtieth in France.

Purchase of Coal and Timber Lands

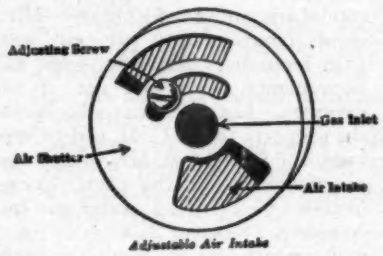
Samuel Insull, chairman of the board of the Peoples Gas Light & Coke Company, of Chicago, and head of a group of many gas utilities in various sections of the country, is one of a group of Chicago capitalists who have just purchased 125,000 acres of coal and timber land in Leslie, Perry and Clay Counties, Kentucky, according to news dispatches received at Chicago from Lexington, Ky. The consideration is said to have been $700,000.

New York parties said to be interested in the deal are the Semet-Solvay Coal Company, Williams & Peters and Harry Payne Whitney. The land is undeveloped and far away from railroad connections.

Tells Consumers How to Get Best Results From Gas Ranges

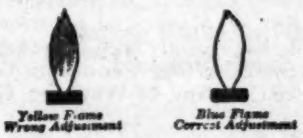
The Peoples Gas Light & Coke Company, of Chicago, believes in the sound principle of educating consumers to a more economic use of gas, as is shown in the following item reprinted from one of their letter enclosures:

"If your gas range does not burn just the way that it should, the probability is that it is getting either too much or not enough air. This is a little matter which can be remedied by anyone with the aid of a screwdriver.



Adjustable Air Intake

"The *air intake* is directly behind the handle, or valve, which you use to turn the gas on or off. This *'air intake'* has a sliding shutter fastened in place by a *small screw*. Loosen the screw and turn the shutter until the *air intake* is completely closed. Then turn on the gas and light the burner. You will find that it turns with a yellow flame. Open the *air shutter slowly*, watching the flame meanwhile until it is all blue, then tighten the screw so that the *air shutter* cannot slip.



"If your gas range 'pops' back when lighted it is generally because it is getting too much air.

"The top burner on your gas range should be kept clean or you will not get the best results."

Atlanta Gas Send-Out Record Broken in Cold Week

The continued cold of this winter, combined with the coal shortage, has had a most remarkable effect on the consumption of gas in Atlanta, Ga., and suburbs. All records were broken for a day or a week, and gas was used for every purpose possible.

The supply of gas heaters on hand at the Atlanta Gas Light Company had been exhausted before the cold reached its most intense stage, but those sold proved of inestimable benefit when the mercury dropped to a few degrees above zero.

The demand for some form of heat besides that produced by coal brought about a remarkable jump in the gas send-out. It eclipsed even the cold week of the previous month, when the send-out was 28,800,000 cu. ft., for the week ending Jan. 20 showed a record of 29,927,000 cu. ft. One day of that week, Jan. 12, set a record of more than 5,000,000 cu. ft. send-out.

The week ending Jan. 6 brought an increase in send-out of 44 per cent over the same week in 1917; that ending Jan. 13, a 42 per cent increase; that of Jan. 20 an increase of 48 per cent, and that of Jan. 27 a gain of 53 per cent, the most phenomenal in the history of the company.

Holland, Mich., to Pay 35 Cents More For Gas

On order of the Grand Rapids Trust Company, receiver for the Holland (Mich.) City Gas Company, the rate for gas at Holland has been advanced from 90 cents to $1.25 per 1,000. The city council has accepted the new rates as alternative to closing the plant.

95 Cent Rate Asked By East Boston Company

The East Boston Gas Company has petitioned to the gas and electric light commission for a hearing on a proposed increase in the price of gas. The present rate is 80 cents a thousand cubic feet. The company asks that it be permitted to fix the price at 95 cents a thousand. The company claims that it cannot produce gas at the present rate without losing money, under existing conditions. The cost of everything entering into the production of gas has been advancing until it has reached a point where the company says it is impossible to continue the present rate and break even.

A public hearing was to be held at the office of the board, 603 Ford Building, Boston, on Friday, Feb. 8, at 10 a. m.

Pertinent Suggestions for Increasing Efficiency of Commercial Dept.

(*Continued from page* 186)

Accept his suggestions for arranging samples, decorating windows and newspaper advertising.

Put on some demonstrations and special sales.

He knows what is proving successful in other cities. You will find him always ready to work and work hard to put your commercial department on a paying basis, and he can do it, too, if you will co-operate with him and stick to him instead of trying every cheap piece of goods that is shown you.

THE COST OF SPLIT ORDERS

When you buy price goods, or split your business among several manufacturers, your volume must be so small for each that you cannot expect any salesman or factory to give you much assistance. They cannot afford to.

But when you ally yourself to a high-grade appliance manufacturer, and show the spirit to be loyal, both the manufacturer and his salesmen will give you the fullest co-operation, and you cannot find a single case where this has been done, but that results have been realized even beyond expectations.

Stimulate your salesmen by putting them on a profit-sharing basis.

Get out of the old rut and try a year of modern merchandising under the guidance of a high-grade manufacturer and his representative, and you will never want to go back to the old "price only" method of running a commercial department.

Floods Cause Trouble At Cincinnati Plant

The Union Gas & Electric Company, of Cincinnati, Ohio, is feeling the effects of the flood. Vice-president Cartwright said: "Only a short time ago we had to take 4,000 gas meters out of houses in the flooded sections and we scarcely got them back when the second flood came, and we had to take 5,000 more out.

"The flood water is getting into our gas mains in the bottoms district, and they will have to be pumped dry when the water recedes. In the meantime extra pressure must be applied to get the gas through."

Personal Notes

J. FRANK STACEY, who for a period of twenty years filled the position of vice-president and general manager of the Nashville (Tenn.) Gas Company, is now connected with the Stacey Manufacturing Company, of Cincinnati, Ohio, having recently been elected active vice-president. When Mr. Stacey took charge of the Nashville company, its capital was $500,000. From time to time stock dividends were declared, until the capital amounted to $1,175,000. Dividends from 4 to 10 per cent were paid annually. All extensions and betterments were paid out of the earnings. Just previous to the sale of the property to the C. H. Geist Company for $2,000,000, Mr. Stacey had practically rebuilt the plant, having installed two U. G. I. water gas sets complete (capacity 1,500,000), also new retort house with eighteen benches of nines, with "Bronder" charging and discharging machines. When the property was turned over to the C. H. Geist Company it was practically free from debt; no bonds had ever been issued.

THE AMERICAN METER COMPANY, INC., with New York offices at Forty-seventh Street and Eleventh Avenue, has recently announced that beginning with Friday, March 1, the company will be located at its new headquarters, 105 West Fortieth Street.

ROY W. MARTIN, of Jeffersonville, Ind., has recently been elected superintendent of the Consumers Gas & Coke Company, of Waycross, Ga.

E. M. STACK, general superintendent of the Scranton (Pa.) Gas & Water Company, has tendered his resignation to the company, which was recently accepted. Mr. Stack came to Scranton from the Edison Electric Light Company, of Philadelphia, about nineteen years ago, representing the McCall, Elkins, Weidner and Snowden interests in the purchase, reorganization and operation of the Scranton Illuminating, Heat & Power Company, the Suburban Electric Light Company, the Dunmore Light, Heat & Power Company, the Scranton Light, Heat & Power Company, the Dickson Electric Light Company and the Economy Steam Heating Company. He was the general manager, secretary and treasurer of these companies and also general manager of the Electric Company of America, the parent or holding company of these and other large electric lighting companies throughout the country. Mr. Stack successfully managed and directed the affairs of these companies for eight or nine years, when the properties were purchased and taken over by The Henry L. Doherty Company interests of New York and merged into the now Scranton Electric Company. He has not as yet made any plans for the future. The duties of the general superintendent will be cared for by Homer Cox, chief engineer, and W. H. Squier, superintendent of the gas works. Mr. Cox will have charge of the outside work and Mr. Squier will be in charge of the plants, lamp trimmers, etc. They have already assumed their duties.

ROBERT C. SHRIVER, who for more than two years has been connected with the office of the Dayton (Ohio) Gas Company, recently left for El Paso, Tex., to accept a position with the El Paso Gas Company. Mr. Shriver has already assumed his duties in the new capacity. He is well known in Dayton, having received his education in the public schools of the city. He graduated from Steele High School with the class of 1915.

ELMER E. CLAY, whose resignation from the Goshen (Ind.) Gas Company was noted in the Feb. 2 issue of the AMERICAN GAS ENGINEERING JOURNAL, has accepted a position with the Goshen Electric Material Company.

E. E. CORKEN was recently elected secretary of the Springfield (Ill.) Gas & Electric Company and the Springfield Consolidated Railways Company, to take the place of E. L. Maxwell, former secretary, who has resigned to take a commission as major in the United States Ordnance Department.

H. G. BONNER, formerly new business manager of the Alliance (Ohio) Gas & Power Company, has been made manager, succeeding F. C. Pratt, who is again attached to the Doherty general engineering staff.

JOSEPH BAMBERGER, who has been in the employ of the Northern Indiana Gas & Electric Company, Lafayette, Ind., for the past ten years, has secured a position as assistant engineer of the Wabash Valley Electric Company, of Clinton, Ind. Mr. Bamberger assumed his new duties Feb. 15.

CLARKE EYERLY, formerly employed by the Mahanoy City (Pa.) Gas Company, has been appointed district superintendent of the Girardville (Pa.) Gas Company. He has already assumed his new duties.

HAROLD KNIGHT has accepted a position with the Wisconsin Gas & Electric Company. He was formerly surveyor in Racine County, Wis.

THE BANGOR (PA.) GAS COMPANY recently held the annual meeting of the stockholders, when the following directors were elected: Davis Hambright and Edward Achenbach to succeed the late George Mutton, of East Bangor, and Samuel Flory, who resigned; William Bray, Sr., of East Bangor; John Langmead, W. F. Jordan, Milton Flory and Joseph Main.

M. A. PALMATEER, of the Southern Illinois Gas Company, Marion, Ill., with his family have moved to Carterville where he will have charge of the Carterville office of the company. He is experienced in all phases of the business and Mrs. Palmateer is a demonstrator and will care for the office during his absence.

JAMES P. MORAN has been appointed to head the coke department of the Municipal Gas Works, of Holyoke, Mass., as sales manager. Mr. Moran will retain his place in the maintenance department.

THE NEW HAVEN (CONN.) GAS LIGHT COMPANY, at its recent stockholders' meeting, re-elected the following directors: George D. Watrous, Frederick P. Brewster, Charles H. Nettleton, Eli Whitney, A. Heaton Robertson, James S. Hemingway, Winston J. Trowbridge, H. Stuart Hotchkiss and James T. Moran, who in turn re-elected the following officers: Charles Nettleton, president; George D. Watrous, vice-president; J. Arnold Norcross, secretary and treasurer; Robert E. Wyant, engineer.

Construction Notes

Extend Pipe Line to West Monroe

According to Louis Lock, construction manager of the Monroe (La.) Gas Company, that company has extended its 6-in. line at Oak Street across the river so as to serve West Monroe. It is said that the new company also will build a line across the river at Pine Street, with a view of forming a belt in West Monroe.

"To date we have laid about 18 miles of pipe in Monroe," said Mr. Lock; " we have about 4 miles more to lay and this should be completed very shortly. We have built a splendid line, adequate to serve a city of 40,000 population, and will be in position to maintain steady pressure throughout the city."

7,000,000-Foot Gasser Brought In At Fort Smith, Ark.

The Clear Creek Oil & Gas Company, of Fort Smith, Ark., recently brought in a 7,000,000-ft. gasser on the Powell farm, a quarter mile from Kibler in Crawford County. This is the company's fifteenth well in that field. Pay sand was struck at 1,980 ft. and was drilled into 37 ft.

Marion, Ill., Company Contemplating Move to New Headquarters

Headquarters of the Southern Illinois Gas Company will be moved from Marion to Murphysboro if the present arrangements of H. L. Farrar, district manager, materializes.

The gas company supplies gas to Marion, Johnston City, West Frankfort, Carterville, Murphysboro and Carbondale, Ill.

New Mains to Be Laid In Westerly, R. I.

In order to eliminate the trouble experienced last summer when the lights in Westerly, R. I., were so poor that several complaints and protests were entered, the Westerly Light & Power Company has decided to lay new mains and otherwise improve the service, and will begin operations as soon as the weather permits. A 12-in. main will be installed from the gas house on Canal Street to Dixon Square, replacing the old 6-in. main.

Along Main Street an 8-in. main will be placed as far as School Street, and with these two large mains it is expected that a greater supply will be ample for a number of years to come. A new gas manufacturing apparatus has been purchased and will be installed at once.

Waycross, Ga., Company Awards Contract to Enlarge Capacity

The Consumers Gas & Coke Company, of Waycross, Ga., has awarded the Park-Morand Company, contractors, a contract for installing a new gas-producing unit that will add about 50 per cent to the plant's capacity. The work must be completed within the next sixty days.

New Gas Generator Being Installed At Spartanburg, S. C.

The South Carolina Light, Power & Railways Company, of Spartanburg, S. C., is improving and enlarging its gas plant on the Southern Railway, near Beaumont, work having begun on the construction of a new generator which will have a capacity of 50,000 cu. ft. of gas.

With the completion of the new gas generator the gas plant will be in a position to give gas service that will be second to none in the State, provided the quality and quantity of coal is secured. The company now has in operation three generators, each having a capacity of 50,000 cu. ft. of gas, and when the new generator is installed the plant will have a total capacity of 200,000 ft. of gas, enough to meet the needs of a city with a population larger than Spartanburg.

The work of improving the gas plant was decided upon shortly after the arrival of Mr. Hinckey, the new superintendent of the gas plant. Mr. Hinckey says that the quality of the gas has improved considerably lately, and when the new generator is in operation there will be a greater improvement.

Well Being Drilled At Grand Forks, N. D.

The discovery of a flow of natural gas in Grand Forks, N. D., is causing somewhat of a sensation there. Well drillers tapped the gas supply about 60 ft. down. E. J. Babcock, of the School of Mines, after a test of the gas, declared that it was a good sample of natural gas, and that it appeared to be coming through about 80 ft. of water.

Further tests will be made. The well in question is being drilled for the Bridgeman-Russell Company.

Dixie Gas Company Plans Further Developments

Plans of the Dixie Gas Company, Birmingham, Ala., developing on the Aldrich dome several miles from the city on Shades Mountain, include further prospecting for gas, though three wells in already are estimated to have a daily capacity of 2,600,000 cu. ft. of gas.

An underwriting syndicate has been at work, and the company is assured of all the working capital it can use during the next six months, and there will be no loss of time or action. A deep diamond drill test 1½ miles from the present wells on Aldrich dome, showed five distinct gas sands below the sand which has already been tapped by the drillers. An estimate, made by T. H. Aldrich, Jr., of the gas in the Aldrich dome, places the amount at over 33,000,000,000 cu. ft., enough gas for Birmingham and district for many years to come.

The allotted stock of the Dixie Gas Company is 50,000 shares, of which one-fifth has been underwritten in Birmingham, three-fifths was assigned to New York, and one-fifth to Virginia, the home of J. L. Vaughn, director. Future plans include the piping of the gas to the city and for industrial plants in the district.

THE NEW HAVEN (CONN.) GAS LIGHT COMPANY held its annual stockholders' meeting recently, at which President Charles H. Nettleton, in his annual report, stated that there was sold over a billion and a half feet of gas during the year, an increase of over 58,000,000 ft., or 3.769 per cent more than the year previous. There are in service runs, 940; meters increased, 1,726; meters in use, 57,536; spent in construction, $167,545. The principal items charged to construction are: Account vertical retort house, $28,220; general equipment, $24,736; street mains, $22,382; services, $17,613; meters and installation, $19,044; No. 4 tar still, $12,612; outdoor purifiers and connections, $39,781; trenching machines, $4,350; four storage tanks for solvents, $1,180; two pitch coolers, $2,627. The new business department has sold 9,599 appliances and has done a business of $210,280.56, a gain of 37.5 per cent over last year. The income from this source exceeded that of 1916 by $79,111.

THE KINGSTON GAS & ELECTRIC COMPANY, Kingston, N. Y., a subsidiary of the American Gas Company, in its annual report for 1917 shows a total increase in operating revenue of $30,351 for the combined gas and electric departments. Kingston is one of the Hudson River towns, the industrial conditions of which are unaffected by war business.

THE BALTIMORE (MD.) GAS APPLIANCE & MANUFACTURING COMPANY held its annual meeting recently at which a 3½ per cent dividend was declared on the preferred stock and a 1½ per cent dividend on the common to stockholders of record on Feb. 23. The dividends are payable March 1. All officers and directors of the organization were re-elected.

THE COLUMBIA GAS & ELECTRIC COMPANY'S income account for the year ended Dec. 31, 1917, showed gross earnings of $10,861,840, an increase over 1916 of $1,803,588; net after taxes, $5,222,073, an increase of $787,597; total income, $7,170,687, an increase of $1,908,609; balance after charges, $2,934,485, an increase of $1,777,009.

THE CONTINENTAL GAS & ELECTRIC COMPANY reports earnings of its subsidiaries as follows:

	1917	1916	1915
Gross earnings	$1,302,704	$714,200	$566,589
Operating expenses, including maintenance, taxes and insurance	930,697	473,751	361,996
Interest on bonds of subsidiaries	32,910	5,790	5,790
Balance	339,096	234,662	198,803
Interest on funded debt of Continental Gas & Electric	118,835	88,630	79,540

President C. S. Eaton says: "The year 1917 proved the most prosperous in the history of the company. Gross business was nearly twice that of the preceding year. None of the gain in gross is due to war demand, and so far as we are aware none will be affected by the coming of peace. Net earnings, while proportionately reduced by increases in cost of materials, were larger than for any corresponding period.

"Costs of coal, oil, labor and material reached during 1917 what is felt to be their peak, and it follows, therefore, that the net earnings of the company for the past year are less than its normal earning capacity. No advances were made in rates to consumers, but steps have been taken to advance rates about 20 per cent.

"Due to the general scarcity of money, demand for additional service is now exceeding the supply of available funds, and the growth of the company during 1918 will depend on the support given the company by its present stockholders. Profitable extensions are demanded on all sides. Stockholders are invited to make further investments in the company's securities."

THE LACLEDE GAS LIGHT COMPANY'S statement for the year ended Dec. 31, 1917, shows increase in gross earning as compared with that of 1911. Report for the year ended Dec. 31 is as follows:

	1917	1916
Gross earnings	$4,800,264	$4,509,424
Bal. after taxes	2,612,522	2,846,247
Reserves	364,807	359,551
Net earnings	2,247,714	2,486,695
Int. and pfd. divs.	1,329,533	1,281,500
Surplus	*918,181	1,199,195

*Equal to $8.58 a share on $10,700,000 common stock, compared with $11.21 a share in 1916.

THE SPRING VALLEY UTILITIES COMPANY has filed an application with the Public Utilities Commission of Illinois for temporary suspension of gas service in the city of Spring Valley.